US Army Corps
of Engineers
Huntsville Division

ST. LOUIS AAP

St. Louis, Missouri

Investigation and Evaluation of Underground Storage Tanks

September 1989

Prepared for:

Department of the Army
Corps of Engineers
Huntsville Division
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Contents

EXECUTIVE SUMMARY

An underground storage tank (UST) site investigation at St. Louis AAP was performed by Omaha District Personnel on 21 August 1989. A total of five tanks were inventoried. Since these tanks were last used prior to January of 1984, it was determined that all tanks are eligible for DERA funding for removal/closure.

INTRODUCTION

INTRODUCTION

On September 23, 1988, the Environmental Protection Agency published Title 40, Code of Federal Regulations, Part 280 (40 CFR 280). This regulation established specific requirements for the design, performance, and monitoring of both new and existing underground storage tanks (UST's). In order to comply with 40 CFR 280, the Army Material Command (AMC) tasked the U. S. Army Corps of Engineers, Huntsville Division (CEHND) with investigating all known UST'S at all installations under the U. S. Army Depot Systems Command (DESCOM) and the U. S. Army Armament Munitions and Chemical Command (AMCCOM). CEHND subsequently contracted with the U. S. Army Corps of Engineers, Omaha District, to conduct all field investigations and develop a program to bring these tanks into compliance with 40 CFR 280. As per the Scope of Work (SOW), the investigations and compliance plans focus primarily on UST's which qualify for funding under the Defense Environmental Restoration Account (DERA).

SCOPE OF STUDY

SCOPE OF STUDY

All known existing UST's, as defined by 40 CFR 280, were investigated. In addition, all heating oil tanks were investigated. Each investigation consisted of a site visit to each tank, compilation of tank data, collection of EPA Form 7530 or state registration form for each UST, and collection of installation data such as underground water tables, installation soils data, and tank location upon the installation. Based on the findings of the investigation, a compliance plan was developed for each installation., This plan addresses the actions required, the costs involved, and the compliance dates required to bring each DERA eligible UST into compliance with the applicable provisions of the regulation. Remedial actions will be based on source control only, not groundwater remediation.

UNDERGROUND STORAGE TANK

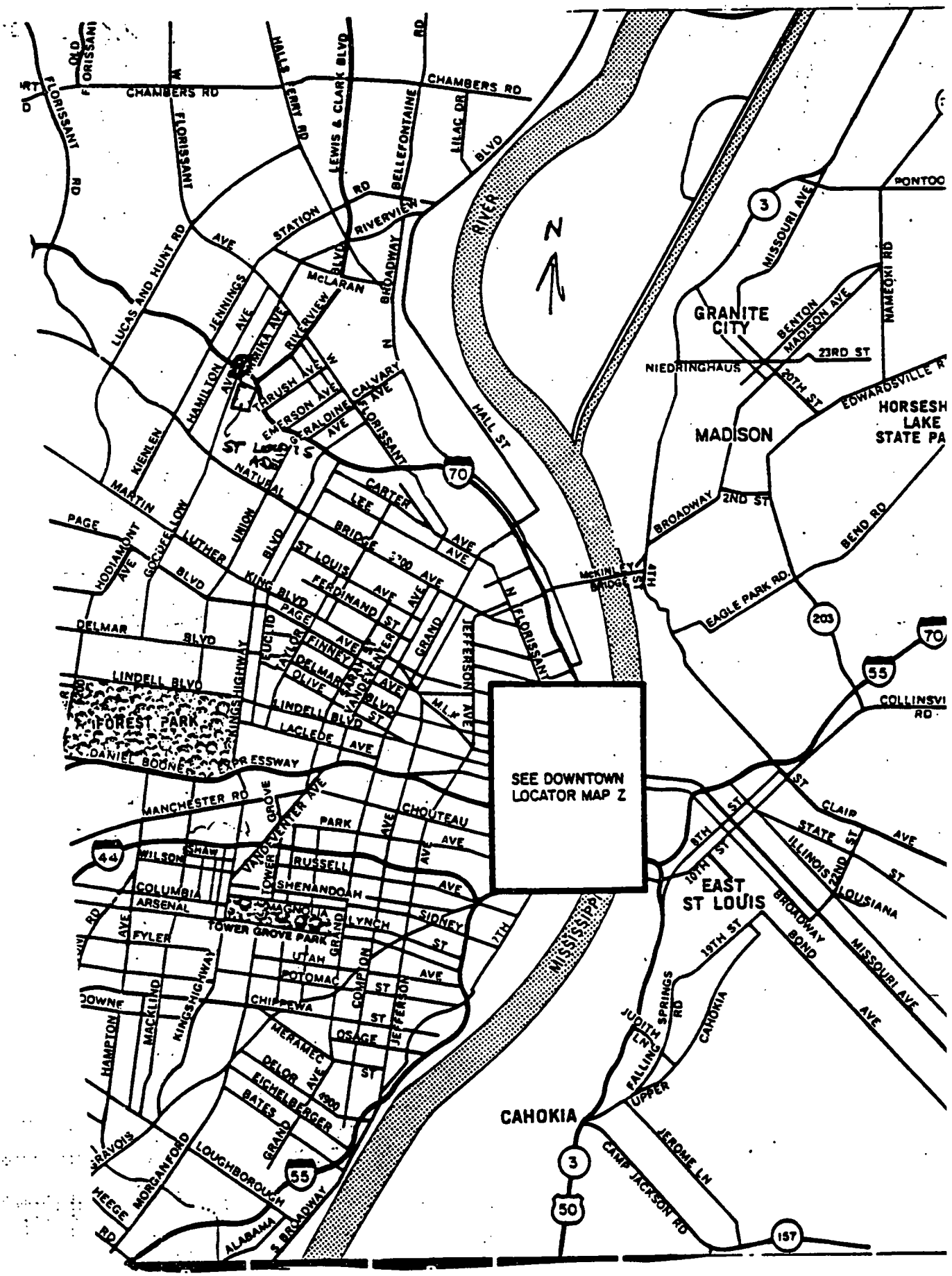
INVESTIGATION AND EVALUATION INVENTORY

ST LOUIS AAP

ST. LOUIS MISSOURI

SEPTEMBER 1989

INSTALLATION MAPS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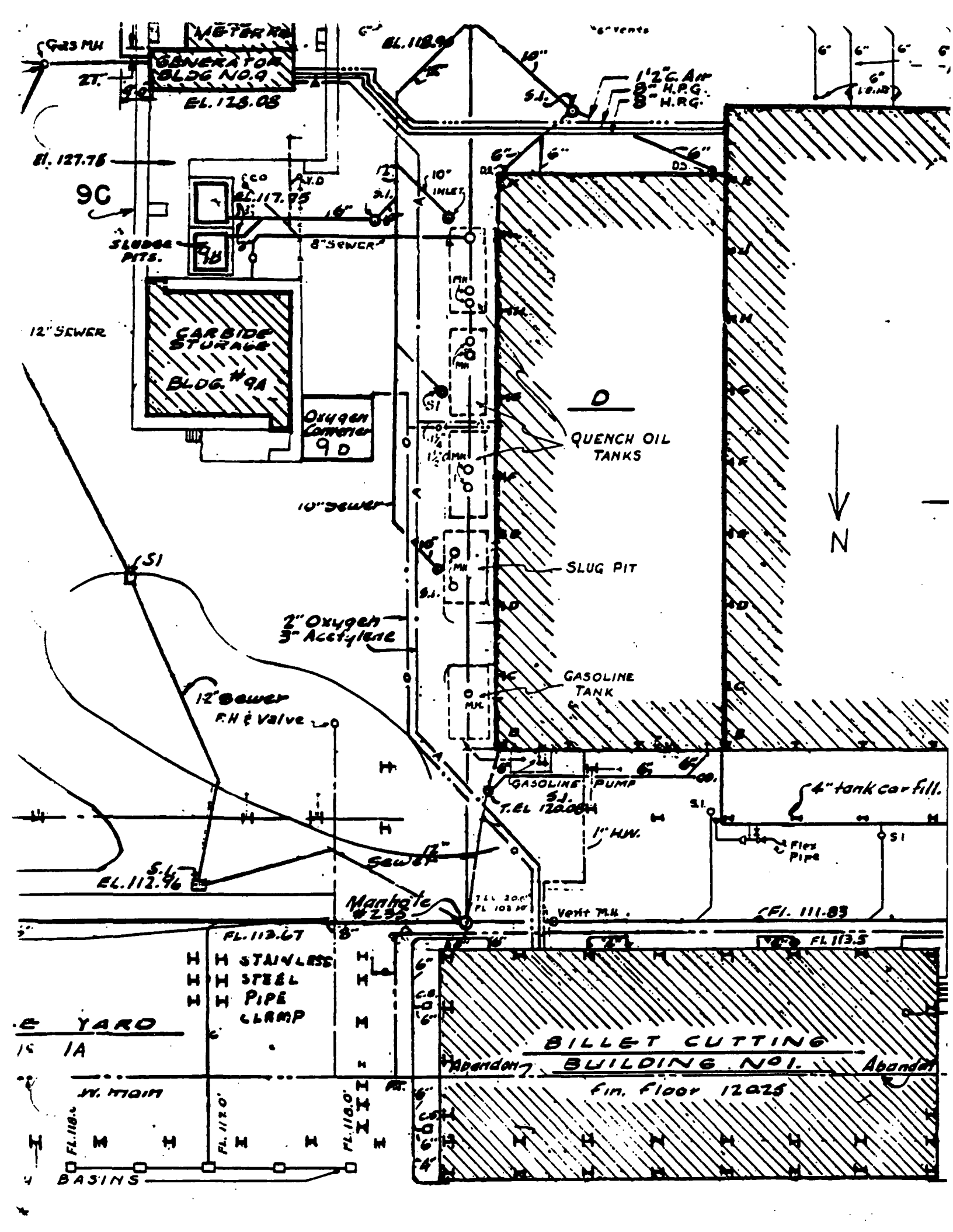
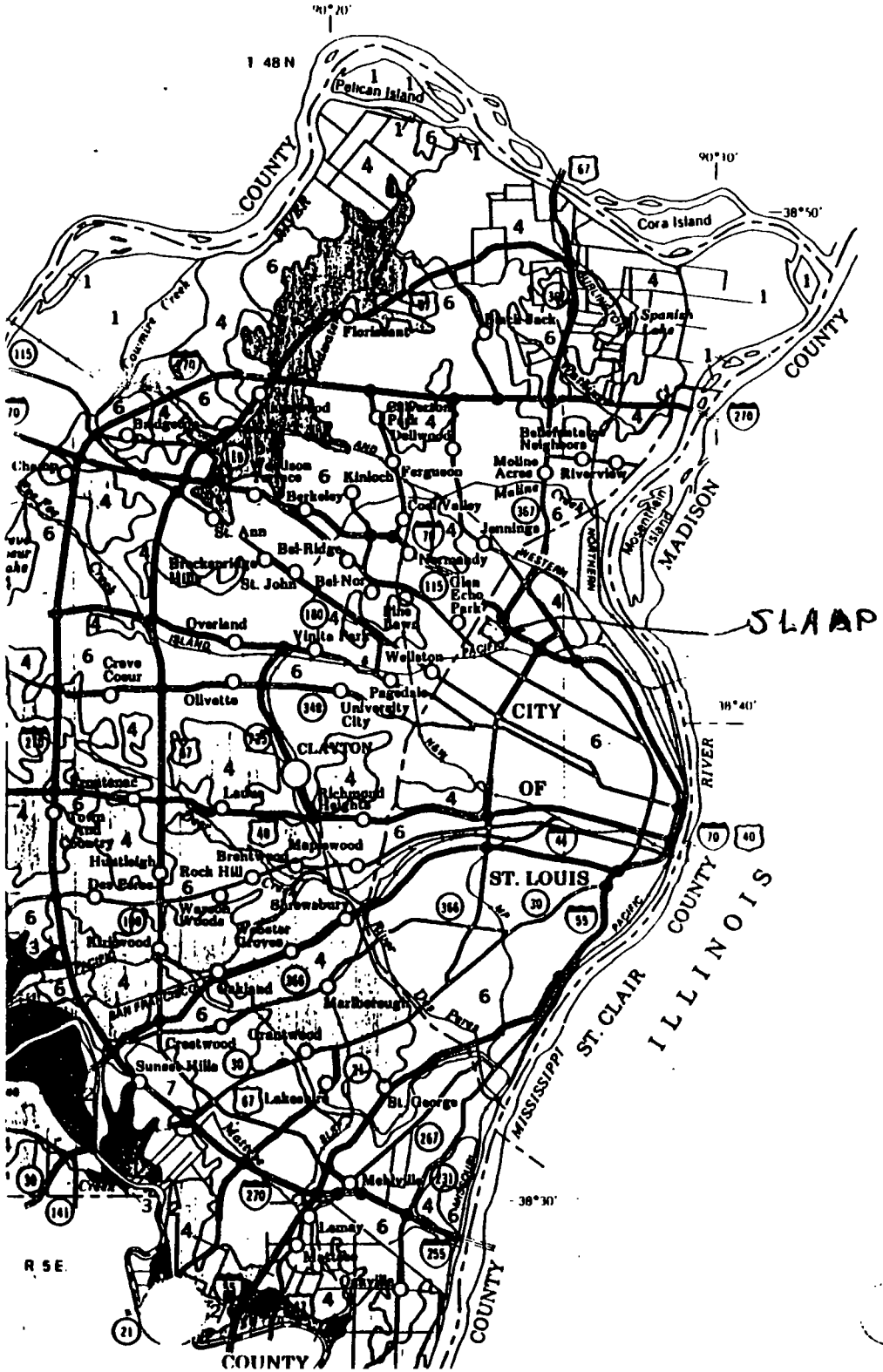
FLORISSANT RD
LEWIS & CLARK BLVD
BELLEFONTAINE RD
LILAC DR
STATION
RIVERVIEW BLVD
BROADWAY
McLAREN
LUCAS AND HUNT RD
JENNINGS AVE
HAMILTON AVE
TARRUSH AVE
EMERSON AVE
GERALDINE AVE
CALVARY AVE
HALL ST
KIENLEN
MARTIN
NATURAL
CARTER
LEE
BRIDGE
PAGE
HODIAMONT AVE
GOODFELLOW
LUTHER
UNION BLVD
KING BLVD
FERDINAND AVE
DELMAR BLVD
LINDELL BLVD
FINNEY
OLIVE
LACLEDE AVE
DANIEL BOONE EXPRESSWAY
MANCHESTER RD
VANDEVENTER AVE
GROVE
PARK AVE
CHOUTEAU AVE
WILSON
SHAW
RUSSELL
SHENANDOAH AVE
COLUMBIA
ARSENAL
MAGNOLIA
LYNCH
SIDNEY
TOWER GROVE PARK
FYLER
UTAH
POTOMAC
CHIPPEWA
COMPTON AVE
OSAGE
MERAMEC
DELOR
EICHELBERGER
BATES
GRAND
LOUGHBOROUGH
MORGANFORD
MEEGE RD
ALABAMA
S BROADWAY
HAMPTON
MACKLIND
KINGSHIGHWAY
JEFFERSON AVE
17TH
ST LOUIS
FOREST PARK
SEE DOWNTOWN LOCATOR MAP Z
MISSISSIPPI RIVER
N
MISSOURI AVE
PONTOO
GRANITE CITY
BENTON
MADISON AVE
NAMEOKI RD
23RD ST
NIEDRINGHAUS
20TH ST
EDWARDSVILLE R
HORSESH
LAKE
STATE PA
MADISON
BROADWAY
2ND ST
BEND RD
MCKINLEY BRIDGE
9TH
EAGLE PARK RD.
203
70
55
COLLINSVI
RD
ST CLAIR
STATE ST
ILLINOIS
22ND ST
LOUISIANA
BROADWAY
MISSOURI AVE
BOND AVE
EAST ST LOUIS
8TH ST
10TH ST
19TH ST
JUDITH LN
FALLING SPRINGS RD
CAHOKIA
UPPER
CAHOKIA
JEROME LN
CAMP JACKSON RD
3
50
157
44


Gas MH
METER RM
GENERATOR BLDG NO. 9
EL. 128.08
EL. 127.78
9C
CO
EL. 117.95
SLUDGE PITS.
8" SEWER
12" SEWER
CARBIDE STORAGE BLDG. #9A
Oxygen Cylinder 9D
10" SEWER
SI
2" Oxygen
3" Acetylene
12" Sewer
F.H. & Valve
EL. 112.96
Manhole #252
FL. 113.67
STAINLESS STEEL PIPE CLAMP
E YARD
1A
W. MAIN
FL. 118.0
FL. 112.0
FL. 116.0
4 BASINS
EL. 118.9
10" INLET
1 1/2" C. Air
8" H.P.G.
8" H.P.G.
D
QUENCH OIL TANKS
SLUG PIT
GASOLINE TANK
GASOLINE PUMP
T.EL 120.0
1" H.W.
Vent M.H.
4" tank car fill.
Flex Pipe
Fl. 111.83
FL 113.5
BILLET CUTTING
BUILDING NO1.
Abandon
Abandon
Fin. Floor 120.25
N

SOIL MAPS



U.S. DEPARTMENT OF AGRICULTL
SOIL CONSERVATION SERVICE
MISSOURI AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

ST. LOUIS COUNTY AND ST. LOUIS CITY, MISSOURI

Scale 1: 253,440

1 0 1 2 3 4 Miles

1 0 1 2 3 4 5 6 Kilometers

SOIL LEGEND

1	Blake Eudora Waldron association Nearly level, somewhat poorly drained and well drained, deep soil formed in alluvial sediment, on flood plains
2	Wilbur Haymond Elsah association Nearly level and gently sloping, moderately well drained to somewhat excessively drained, deep soils formed in alluvial sediment, on flood plains
3	Freeburg Ashton Weller association Nearly level and gently sloping, somewhat poorly drained to well drained, deep soils formed in loess and alluvial sediment; on terraces
4	Menfro Winfield Urban land association: Gently sloping to very steep, well drained and moderately well drained, deep soils formed in loess, and Urban land, on uplands
5	Nevin Urban land association Nearly level, somewhat poorly drained, deep soils formed in loess or lacustrine sediment, and Urban land; on depressional uplands
6	Urban land Harvester-Fishpot association: Urban land and nearly level to moderately steep, moderately well drained and somewhat poorly drained, deep soils formed in silty fill material, loess, and alluvium on uplands, terraces, and bottom lands
7	Goss Gasconade Menfro association Moderately sloping to very steep, well drained and somewhat excessively drained, deep and shallow soils formed in limestone residuum and loess; on uplands

Compiled 1981


Glen Echo Park
Beverley Hills
Arbor Terrace
Northwood
Goodfellow Terrace
Pine Lawn
Uplands Park
Greendale
Velda Village Hills
Velda
Hillsdale
Pagedale
Wellston
ST. LOUIS
SLAG
N
RAILROAD

...ces, the fill material is more than 40 inches thick, or part or all of the original soil has been removed during land shaping, or the surface layer is silty clay loam, or one or more soil layers contain more than 20 percent coarse fragments.

Included with this complex in mapping and making up about 5 percent of mapped areas are small areas of well drained Menfro soils, moderately well drained Winfield soils, and somewhat poorly drained Iva soils. These soils are in parks, playgrounds, and a few open spaces between buildings.

The Urban land is impervious to water. Permeability is moderately slow in the Harvester soils. Surface runoff is slow in this complex. The natural fertility is medium, and organic matter content is very low. The surface layer of the Harvester soils is friable.

The Harvester soil in this complex is in yards, open spaces between buildings, parks, playgrounds, gardens, and undeveloped random tracts. Recreation uses are suitable if they can be adapted to the limited size and shape of the open spaces. Permeability is a moderate limitation for camp and picnic areas and playgrounds. Good surface drainage is needed, and areas of heavy foot traffic need resurfacing with suitable material.

The Harvester soils are suitable for building sites. Proper design of structures and extra reinforcement in ...tings, foundations, and basement walls are necessary ...revent damage caused by shrinking and swelling. ...in tile around footings and foundations helps overcome excessive wetness. Community sewers are the chief means for the disposal of waste. Adequate base material for local roads and streets and proper drainage with side ditches and culverts, or tile drains and storm sewers, are needed to prevent damage caused by low strength and frost action.

This complex is not assigned to a capability subclass.

18C—Urban land-Harvester complex, 2 to 9 percent slopes. This complex consists of Urban land and the intermingled areas of gently sloping and moderately sloping, moderately well drained Harvester soils. It is on ridgetops and side slopes on uplands. Individual areas are irregular in shape and range from about 20 to 400 acres. They are about 65 percent Urban land and 30 percent Harvester soils. The Urban land and Harvester soils are so intermingled or in such an intricate pattern that to separate them in mapping was not practical.

The Urban land part of this complex is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the series is not feasible.

Typically, the surface layer of the Harvester soil is very dark grayish brown silt loam about 4 inches thick. The ...xt layer, to a depth of about 25 inches, consists of ...icolored silt loam and silty clay loam fill material that ...ains cinders. Below the reworked fill material to a depth of about 60 inches is a buried soil. It is brown and pale brown silt loam in the upper part and yellowish brown and dark yellowish brown, firm silty clay loam in the lower part. In places, the fill material is more than 40 inches thick. Also in places, part or all of the original soil has been removed during land shaping, or the surface layer is silty clay loam, or the fill material contains more than 20 percent fragments of manmade materials.

Included with this complex in mapping and making up about 5 percent of mapped areas are small areas of well drained Menfro soils, moderately well drained Winfield soils, and somewhat poorly drained Iva soils in parks, playgrounds, and a few open spaces between buildings.

The Urban land is impervious to water. Permeability is moderately slow in the Harvester soils. Surface runoff is rapid in the complex. The natural fertility is medium, and organic matter content is very low. The surface layer of the Harvester soils is friable.

The Harvester soils in this complex are in yards, open spaces between buildings, parks, playgrounds, gardens, and undeveloped random tracts (fig. 6). Recreation uses are suitable if they can be adapted to the limited size and shape of the open spaces and to the slope. Permeability is a moderate limitation for camp and picnic areas. Good surface drainage is needed, and areas of heavy foot traffic need resurfacing with suitable material.

The Harvester soils are suitable for building sites. Proper design of structures and extra reinforcement in footings, foundations, and basement walls are necessary to prevent damage caused by shrinking and swelling. Drain tile around footings and foundations helps overcome excessive wetness. Community sewers are the chief means for the disposal of waste. Adequate base material for local roads and streets and proper drainage with side ditches and culverts, or tile drains and storm sewers, are needed to prevent damage caused by low strength and frost action. Detailed onsite investigation is needed in areas where site preparation requires cuts of several feet.

This complex is not assigned to a capability subclass.

18D—Urban land-Harvester complex, 9 to 20 percent slopes. This complex consists of Urban land and the intermingled areas of strongly sloping and moderately steep, moderately well drained Harvester soils. It is on uplands on the side slopes of valleys. Individual areas are irregular in shape and range from about 10 to 120 acres. They are about 50 to 60 percent Urban land and 20 to 30 percent Harvester soils. The Urban land and Harvester soils are so intermingled or in such an intricate pattern that to separate them in mapping was not practical.

The Urban land part of this complex is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the series is not feasible.

Typically, the surface layer of the Harvester soil is dark brown silt loam about 3 inches thick. The next layer, to a depth of about 33 inches, consists of multicolored silt loam, silty clay loam, and clay fill material that contains

EPA FORM 7530s

ST. LOUIS

DATE: 08/21/89

INVENTORY OF UNDERGROUND STORAGE TANKS FOR DERA ELIGIBILITY

INSTALLATION: St. Louis AAP LOCATION: St. Louis, MO.

POC @ INSTALLATION: (name & no/.) Merle Humphries (314) 263-3842

TEAM LEADER : J. Davis TEAM ASSIST. J. Nelson

TANK ID NO. : (assigned no/) SLAAP - 01 (other) At New Bldg 3

A. OFFICE DATA (Obtain prior to field work) NOTES

1. Status of tank:
   a. Currently in use ____
   b. Temporarily out of use ____
   c. Permanently out of use X
   d. Brought into use after 5/8/86 ____
   e. Not been used since Jan. 1984 X
   f. Leakage prior to March 1, 1986 ____
   (The Installation must have evidence)

2. Support Function of Tank (relationship to building or support use of tank):
   Quench Oil TANKS

3. Estimated Age (in years) 49 Date installed __/__/46

4. Tank Manufacturer (if known) _____

5. Estimated Total Capacity 15,000 gallons

6. Material of Tank Construction: (Mark one only)
   a. Steel X
   b. Concrete ____
   c. Fiberglass ____
   d. Unknown ____
   e. Other ____

7. Internal Protection: (Mark all that apply)
   a. Cathodic Protection ____
   b. Interior Lining (epoxy, etc) ____
   c. None ____
   d. Unknown X
   e. Other ____

8. External Protection: (Mark all that apply)
   a. Cathodic Protection ____
   b. Painted ____
   c. Asphaltic coating, etc. ____
   d. Fiberglass/Plastic Coated ____
   e. None ____
   f. Unknown X
   g. Other ____

9. Piping:

(Mark all that apply)

a. Bare Steel _____
b. Galvanized Steel _____
c. Fiberglass Reinforced Plastic _____
d. Cathodically Protected _____
e. Unknown X
f. Other _____

10. Changes/improvements to tank after installation (description and dates):

_____

11. Substance Currently or Last Stored in Greatest Quantity by Volume:

(Mark all that apply)

a. Empty X
b. Diesel Fuel _____
c. Kerosene _____
d. Gasoline _____
GRADE #1 #2 ETC. e. Heating Oil _____
f. Used Oil _____

e. Name of principal CERCLA Substance _____
or..f. Chemical Abstract Service (CAS) No. _____
g. Indicate if a mixture of substances are/were stored _____
h. Unknown _____

12. Substance stored in past, if different from the current contents: #6 (Bunker) (PCB FREE)

(Mark all that apply)

a. Diesel Fuel _____
b. Kerosene _____
c. Gasoline _____
d. Heating Oil _____
e. Used Oil _____

f. Name of principal CERCLA Substance _____
or..g. Chemical Abstract Service (CAS) No. _____
h. Indicate if a mixture of substances are/were stored _____
i. Unknown _____
j..Dates stored (if known) __/__/____ to __/__/____

13. Additional Information for Tanks Permanently Taken Out of Service:

a. Estimated date last used __/__/69
b. Estimated quantity remaining 50 (gal.)
c. Tank filled with inert material _____ (sand etc)

14. Estimated depth to the top of Tank (fill over tank) _____ ft

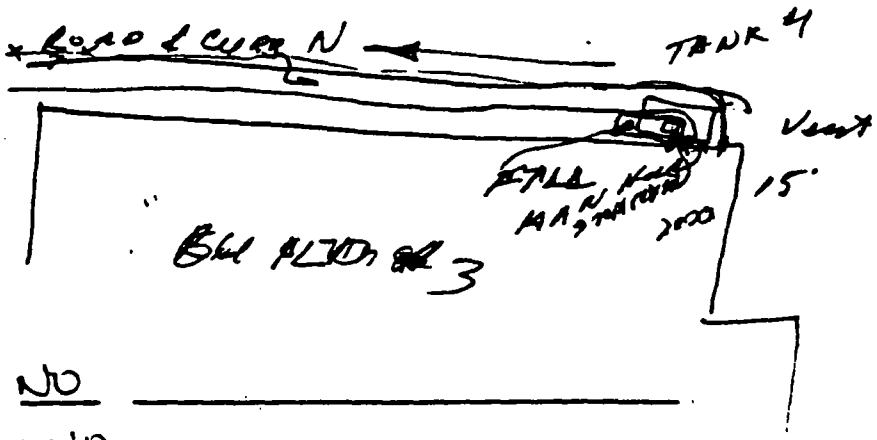
15. Tank testing for tightness and potential leakage (yes/no) N/D

a. Method & Date : _____ __/__/__

b. Results : _____

B. FIELD DATA

1. Sketch of area/layout of tanks:



2. Containment Devices:
   a. Spill Control (yes/no, etc): NO
   b. Overflow Control (yes/no, etc) NO
   other description

3. Evidence of spills during transfer operations: yes no
   a. Description/location spill(s) 2 foot Smear around fill spout
   b. Photograph area and material (if evident) (yes/no) Yes
   c. Quantity of material spilled (if known) 20 gallons

4. Evidence of past/current leakage (pipe system leaks too): yes/no NO
   If no, do not continue with this section.
   a. Type of substance (from #11,12 above)
   b. Cause of leak or spill
   c. Type of leak (tank, pipe, etc)
   d. Quantity of material leaked or spilled gallons
   e. Dates related to leaks or spills
   f. Sources of records for leaks or spills
   g. Corrective actions taken
   h. Photograph area around tank and material (if evident: yes/no)

5. Evidence of soil, groundwater, or surface water contamination caused by UST: yes ____ no NO
   a. Describe contamination
   b. Quantity of material leaked/spilled gallons

6. Compatability of tank with local conditions (examples include: overburden loads from traffic, encroachment of installation functions, etc. List anything that poses as a threat for damage or continued leaking of tank):

7. Overburden conditions (concrete paving, thickness,etc.) 6" SAND, GRAVEL & ROCK - Near Building foundations

8. Depth to highest seasonal groundwater (average/each year): 40 ft ?

a. Source of information: _____

b. Copy/documentation of source obtained (yes/no) NO

9. Type of soil(s) in area around tank (from local SCS maps):

(Mark one)
a. Available from Base _____
b. Obtained from Base _____
c. Obtained from SCS X
d. Need to be obtained from SCS _____

10. Take photographs of unique features related to the tank, piping, fill locations, any evidence of settlement, and the surrounding area (access difficulties): (yes/no) Yes

11. Evidence of Installation correspondance with regulators (NOV's, etc.) on problem/leaking tanks:

a. Documentation of correspondance (yes/no) _____
(If no, do not continue with this section.)

b. Agency contacted _____

c. POC at Agency (& phone) _____

d. Requirements to rectify problem(s) (yes/no) _____

e. Documentation of correspondance obtained (yes/no) _____

12. Obtained copies of any Installation information on tank: (yes/no) Yes

13. Indicate whether additional information is being sent and when its arrival is expected: NO

a. Date of/time until anticipated arrival _____

b. POC for information transmittal (phone) _____

DATE: 08 / 21 / 89

INVENTORY OF UNDERGROUND STORAGE TANKS FOR DERA ELIGIBILITY

INSTALLATION: St. Louis AAP LOCATION: St. Louis, MO.

POC @ INSTALLATION: (name & no/.) Merle Humphries (314) 263-3840

TEAM LEADER : J. Davis TEAM ASSIST. J. Nelsen

TANK ID NO. : (assigned no/) SLAAP-02 (other) At Rear Bn'l 23

A. OFFICE DATA (Obtain prior to field work) NOTES

1. Status of tank:
   a. Currently in use ____
   b. Temporarily out of use ____
   c. Permanently out of use X
   d. Brought into use after 5/8/86 ____
   e. Not been used since Jan. 1984 X
   f. Leakage prior to March 1, 1986 ____
   (The Installation must have evidence)

2. Support Function of Tank (relationship to building or support use of tank):
   Quench Oil Tank

3. Estimated Age (in years) 49 Date installed ___/___/40

4. Tank Manufacturer (if known) ____

5. Estimated Total Capacity 15,000 gallons

6. Material of Tank Construction: (Mark one only)
   a. Steel X
   b. Concrete ____
   c. Fiberglass ____
   d. Unknown X
   e. Other ____

7. Internal Protection: (Mark all that apply)
   a. Cathodic Protection ____
   b. Interior Lining (epoxy, etc) ____
   c. None ____
   d. Unknown ____
   e. Other ____

8. External Protection: (Mark all that apply)
   a. Cathodic Protection ____
   b. Painted ____
   c. Asphaltic coating, etc. ____
   d. Fiberglass/Plastic Coated ____
   e. None ____
   f. Unknown X
   g. Other ____

9. Piping: (Mark all that apply)

a. Bare Steel _____
b. Galvanized Steel _____
c. Fiberglass Reinforced Plastic _____
d. Cathodically Protected _____
e. Unknown X
f. Other _____

10. Changes/improvements to tank after installation (description and dates):

_____

11. Substance Currently or Last Stored in Greatest Quantity by Volume: #6 Bunker oil (PCB Free)

(Mark all that apply) GRADE #1 #2 ETC.

a. Empty X
b. Diesel Fuel _____
c. Kerosene _____
d. Gasoline _____
e. Heating Oil _____
f. Used Oil _____
e. Name of principal CERCLA Substance _____
or..f. Chemical Abstract Service (CAS) No. _____
g. Indicate if a mixture of substances are/were stored _____
h. Unknown _____

12. Substance stored in past, if different from the current contents:

(Mark all that apply)

a. Diesel Fuel _____
b. Kerosene _____
c. Gasoline _____
d. Heating Oil _____
e. Used Oil _____
f. Name of principal CERCLA Substance _____
or..g. Chemical Abstract Service (CAS) No. _____
h. Indicate if a mixture of substances are/were stored _____
i. Unknown _____
j..Dates stored (if known) __/__/____ to __/__/____

13. Additional Information for Tanks Permanently Taken Out of Service:

a. Estimated date last used __/__/69
b. Estimated quantity remaining _____ (gal.)
c. Tank filled with inert material _____ (sand etc)

14. Estimated depth to the top of Tank (fill over tank) 3 ft

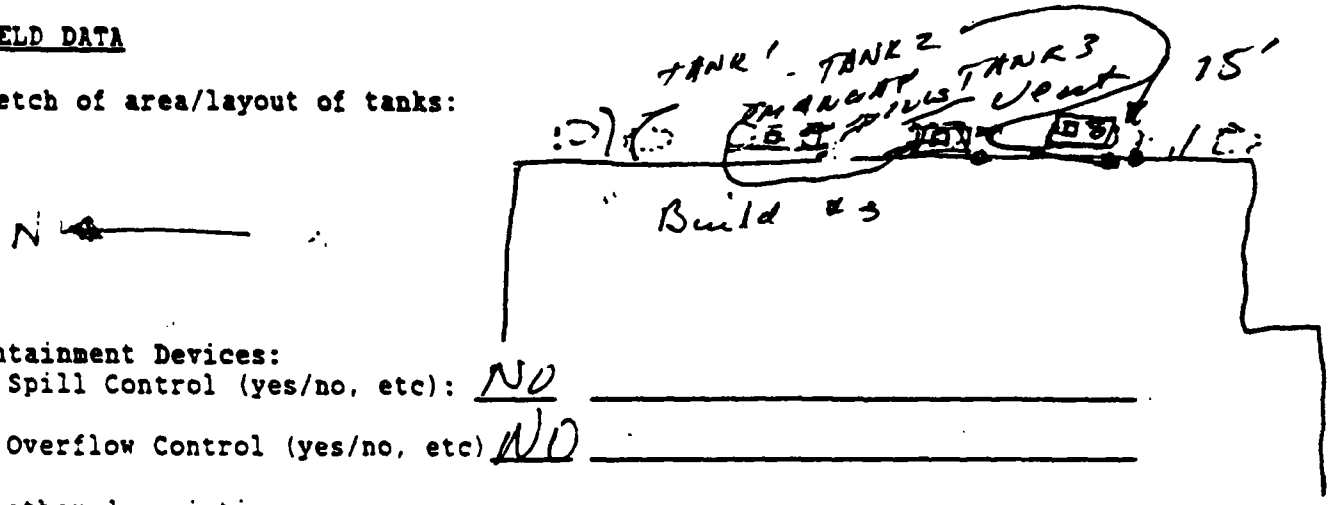
15. Tank testing for tightness and potential leakage (yes/no) NO

a. Method & Date : _____ __/__/__

b. Results : _____

B. FIELD DATA

1. Sketch of area/layout of tanks:



2. Containment Devices:
   a. Spill Control (yes/no, etc): NO
   b. Overflow Control (yes/no, etc) NO
   other description _____

3. Evidence of spills during transfer operations: yes ____ no NO
   a. Description/location spill(s) _____
   b. Photograph area and material (if evident) (yes/no) _____
   c. Quantity of material spilled (if known) _____ gallons

4. Evidence of past/current leakage (pipe system leaks too): yes/no NO
   If no, do not continue with this section.
   a. Type of substance (from #11,12 above) _____
   b. Cause of leak or spill _____
   c. Type of leak (tank, pipe, etc) _____
   d. Quantity of material leaked or spilled _____ gallons
   e. Dates related to leaks or spills _____
   f. Sources of records for leaks or spills _____
   g. Corrective actions taken _____
   h. Photograph area around tank and material (if evident: yes/no) _____

5. Evidence of soil, groundwater, or surface water contamination caused by UST: yes ____ no NO
   a. Describe contamination _____
   b. Quantity of material leaked/spilled _____ gallons

6. Compatability of tank with local conditions (examples include: overburden loads from traffic, encroachment of installation functions, etc. List anything that poses as a threat for damage or continued leaking of tank):

_____

7. Overburden conditions (concrete paving, thickness,etc.) 8" of Sand, Gravel & Rock - Near Building Foundation

8. Depth to highest seasonal groundwater (average/each year): 10 ft?

a. Source of information: _____

b. Copy/documentation of source obtained (yes/no) _____

9. Type of soil(s) in area around tank (from local SCS maps):

(Mark one)
a. Available from Base _____
b. Obtained from Base _____
c. Obtained from SCS _____
d. Need to be obtained from SCS _____

10. Take photographs of unique features related to the tank, piping, fill locations, any evidence of settlement, and the surrounding area (access difficulties): (yes/no) Yes

11. Evidence of Installation correspondance with regulators (NOV's, etc.) on problem/leaking tanks:

a. Documentation of correspondance (yes/no) _____
(If no, do not continue with this section.)

b. Agency contacted _____

c. POC at Agency (& phone) _____

d. Requirements to rectify problem(s) (yes/no) _____

e. Documentation of correspondance obtained (yes/no) ____

12. Obtained copies of any Installation information on tank: (yes/no) Yes

13. Indicate whether additional information is being sent and when its arrival is expected: NO

a. Date of/time until anticipated arrival _____

b. POC for information transmittal (phone) _____

DATE: 08/21/89

INVENTORY OF UNDERGROUND STORAGE TANKS FOR DERA ELIGIBILITY

INSTALLATION: St. Louis AAP LOCATION: St. Louis, MO.

POC @ INSTALLATION: (name & no/.) Merle Humphries (314) 263-3840

TEAM LEADER : J. Davis TEAM ASSIST. J. Nelson

TANK ID NO. : (assigned no/) SLAAP - 03 (other) At Rear Build 3

A. OFFICE DATA (Obtain prior to field work) NOTES

1. Status of tank:
   a. Currently in use ____
   b. Temporarily out of use ____
   c. Permanently out of use X
   d. Brought into use after 5/8/86 ____
   e. Not been used since Jan. 1984 X
   f. Leakage prior to March 1, 1986 ____
   (The Installation must have evidence)

2. Support Function of Tank (relationship to building or support use of tank):
   Quench oil Tank

3. Estimated Age (in years) 49 Date installed __/__/40

4. Tank Manufacturer (if known) ____

5. Estimated Total Capacity 15,000 gallons

6. Material of Tank Construction: (Mark one only)
   a. Steel X
   b. Concrete ____
   c. Fiberglass ____
   d. Unknown ____
   e. Other ____

7. Internal Protection: (Mark all that apply)
   a. Cathodic Protection ____
   b. Interior Lining (epoxy, etc) ____
   c. None ____
   d. Unknown X
   e. Other ____

8. External Protection: (Mark all that apply)
   a. Cathodic Protection ____
   b. Painted ____
   c. Asphaltic coating, etc. ____
   d. Fiberglass/Plastic Coated ____
   e. None ____
   f. Unknown X
   g. Other ____

9. Piping:

(Mark all that apply)

a. Bare Steel _____
b. Galvanized Steel _____
c. Fiberglass Reinforced Plastic _____
d. Cathodically Protected _____
e. Unknown X
f. Other _____

10. Changes/improvements to tank after installation (description and dates):

_____

11. Substance Currently or Last Stored in Greatest Quantity by Volume: #6 Bunker oil (PCB Free)

(Mark all that apply) GRADE #1 #2 ETC.

a. Empty X
b. Diesel Fuel _____
c. Kerosene _____
d. Gasoline _____
e. Heating Oil _____
f. Used Oil _____

e. Name of principal CERCLA Substance _____
or..f. Chemical Abstract Service (CAS) No. _____
g. Indicate if a mixture of substances are/were stored _____
h. Unknown _____

12. Substance stored in past, if different from the current contents:

(Mark all that apply)

a. Diesel Fuel _____
b. Kerosene _____
c. Gasoline _____
d. Heating Oil _____
e. Used Oil _____

f. Name of principal CERCLA Substance _____
or..g. Chemical Abstract Service (CAS) No. _____
h. Indicate if a mixture of substances are/were stored _____
i. Unknown _____
j..Dates stored (if known) __/__/____ to __/__/____

13. Additional Information for Tanks Permanently Taken Out of Service:

a. Estimated date last used __/__/69
b. Estimated quantity remaining _____ (gal.)
c. Tank filled with inert material _____ (sand etc)

14. Estimated depth to the top of Tank (fill over tank) 3 ft

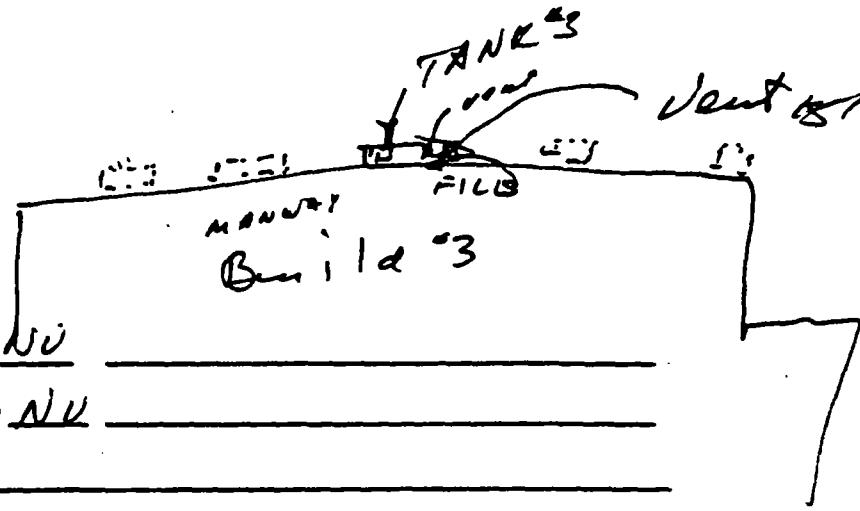
15. Tank testing for tightness and potential leakage (yes/no) NO

a. Method & Date : _____ __/__/__

b. Results : _____

B. FIELD DATA

1. Sketch of area/layout of tanks:



N

2. Containment Devices:
   a. Spill Control (yes/no, etc): NO _____

   b. Overflow Control (yes/no, etc) NO _____

   other description _____

3. Evidence of spills during transfer operations: yes ____ no NO

   a. Description/location spill(s) _____

   b. Photograph area and material (if evident) (yes/no) _____

   c. Quantity of material spilled (if known) _____ gallons

4. Evidence of past/current leakage (pipe system leaks too): yes/no NO
   If no, do not continue with this section.
   a. Type of substance (from #11,12 above) _____

   b. Cause of leak or spill _____

   c. Type of leak (tank, pipe, etc) _____

   d. Quantity of material leaked or spilled _____ gallons

   e. Dates related to leaks or spills _____

   f. Sources of records for leaks or spills _____

   g. Corrective actions taken _____

   h. Photograph area around tank and material (if evident: yes/no) _____

5. Evidence of soil, groundwater, or surface water contamination caused by UST: yes ____ no NO
   a. Describe contamination _____

   b. Quantity of material leaked/spilled _____ gallons

6. Compatability of tank with local conditions (examples include: overburden loads from traffic, encroachment of installation functions, etc. List anything that poses as a threat for damage or continued leaking of tank):

   _____

7. Overburden conditions (concrete paving, thickness, etc.) 6" Sand Gravel & Rock Near Building Foundation

8. Depth to highest seasonal groundwater (average/each year): 10 ± ft

a. Source of information: _____

b. Copy/documentation of source obtained (yes/no) _____

9. Type of soil(s) in area around tank (from local SCS maps):

(Mark one)
a. Available from Base _____
b. Obtained from Base _____
c. Obtained from SCS X
d. Need to be obtained from SCS _____

10. Take photographs of unique features related to the tank, piping, fill locations, any evidence of settlement, and the surrounding area (access difficulties): (yes/no) Yes

11. Evidence of Installation correspondance with regulators (NOV's, etc.) on problem/leaking tanks:

a. Documentation of correspondance (yes/no) NO
(If no, do not continue with this section.)

b. Agency contacted _____

c. POC at Agency (& phone) _____

d. Requirements to rectify problem(s) (yes/no) _____

e. Documentation of correspondance obtained (yes/no) ____

12. Obtained copies of any Installation information on tank: (yes/no) Yes

13. Indicate whether additional information is being sent and when its arrival is expected: NO

a. Date of/time until anticipated arrival _____

b. POC for information transmittal (phone) _____

DATE: 08 / 21 / 89

INVENTORY OF UNDERGROUND STORAGE TANKS FOR DERA ELIGIBILITY

INSTALLATION: St. Louis AAP LOCATION: St. Louis, MO,

POC @ INSTALLATION: (name & no/.) Merle Humphries (314) 263-3840

TEAM LEADER : J. Davis TEAM ASSIST. J. Nelson

TANK ID NO. : (assigned no/) SLAAP - 04 (other) _____

A. OFFICE DATA (Obtain prior to field work) NOTES

1. Status of tank:
   a. Currently in use _____
   b. Temporarily out of use _____
   c. Permanently out of use X
   d. Brought into use after 5/8/86 _____
   e. Not been used since Jan. 1984 _____
   f. Leakage prior to March 1, 1986 _____
   (The Installation must have evidence)

2. Support Function of Tank (relationship to building or support use of tank):
   Sludge from Quench oil operation

3. Estimated Age (in years) 40 Date installed __/__/40

4. Tank Manufacturer (if known) _____

5. Estimated Total Capacity 10,000 gallons

6. Material of Tank Construction: (Mark one only)
   a. Steel _____
   b. Concrete X
   c. Fiberglass _____
   d. Unknown _____
   e. Other _____

7. Internal Protection: (Mark all that apply)
   a. Cathodic Protection _____
   b. Interior Lining (epoxy, etc) _____
   c. None _____
   d. Unknown X
   e. Other _____

8. External Protection: (Mark all that apply)
   a. Cathodic Protection _____
   b. Painted _____
   c. Asphaltic coating, etc. _____
   d. Fiberglass/Plastic Coated _____
   e. None _____
   f. Unknown X
   g. Other _____

9. Piping:

(Mark all that apply)

a. Bare Steel _____
b. Galvanized Steel _____
c. Fiberglass Reinforced Plastic _____
d. Cathodically Protected _____
e. Unknown X
f. Other _____

10. Changes/improvements to tank after installation (description and dates):

---

11. Substance Currently or Last Stored in Greatest Quantity by Volume: #6 Bunker oil SLUDGE from quench oil

(Mark all that apply) GRADE #1 #2 ETC.

a. Empty X
b. Diesel Fuel _____
c. Kerosene _____
d. Gasoline _____
e. Heating Oil _____
f. Used Oil _____

e. Name of principal CERCLA Substance _____
or..f. Chemical Abstract Service (CAS) No. _____
g. Indicate if a mixture of substances are/were stored _____
h. Unknown _____

12. Substance stored in past, if different from the current contents:

(Mark all that apply)

a. Diesel Fuel _____
b. Kerosene _____
c. Gasoline _____
d. Heating Oil _____
e. Used Oil _____

f. Name of principal CERCLA Substance _____
or..g. Chemical Abstract Service (CAS) No. _____
h. Indicate if a mixture of substances are/were stored _____
i. Unknown _____
j..Dates stored (if known) __/__/____ to __/__/____

13. Additional Information for Tanks Permanently Taken Out of Service:

a. Estimated date last used __/__/69
b. Estimated quantity remaining _____ (gal.)
c. Tank filled with inert material _____ (sand etc)

14. Estimated depth to the top of Tank (fill over tank) 6" above ground ft

15. Tank testing for tightness and potential leakage (yes/no) NO

a. Method & Date : _____ __/__/__

b. Results : _____

7. Overburden conditions (concrete paving, thickness,etc.) 15 X 20'
Concrete Pads & Building Curb (Curb to be replaced

8. Depth to highest seasonal groundwater (average/each year): 10 ft ?

a. Source of information: _____

b. Copy/documentation of source obtained (yes/no) _____

9. Type of soil(s) in area around tank (from local SCS maps):

(Mark one)
a. Available from Base _____
b. Obtained from Base _____
c. Obtained from SCS X
d. Need to be obtained from SCS _____

10. Take photographs of unique features related to the tank, piping, fill locations, any evidence of settlement, and the surrounding area (access difficulties): (yes/no) Yes

11. Evidence of Installation correspondance with regulators (NOV's, etc.) on problem/leaking tanks:

a. Documentation of correspondance (yes/no) NO
(If no, do not continue with this section.)

b. Agency contacted _____

c. POC at Agency (& phone) _____

d. Requirements to rectify problem(s) (yes/no) _____

e. Documentation of correspondance obtained (yes/no) _____

12. Obtained copies of any Installation information on tank: (yes/no)_____

13. Indicate whether additional information is being sent and when its arrival is expected:

a. Date of/time until anticipated arrival _____

b. POC for information transmittal (phone) _____

DATE: 08 / 21 / 89

INVENTORY OF UNDERGROUND STORAGE TANKS FOR DERA ELIGIBILITY

INSTALLATION: St. Louis AAP LOCATION: St. Louis, MO.

POC @ INSTALLATION: (name & no/.) Merle Humphries (314) 263-3342

TEAM LEADER : J. Davis TEAM ASSIST. J. Nelson

TANK ID NO. : (assigned no/) SLAAP - 05 (other) _____

A. OFFICE DATA (Obtain prior to field work) NOTES

1. Status of tank:
   a. Currently in use _____
   b. Temporarily out of use _____
   c. Permanently out of use X
   d. Brought into use after 5/8/86 _____
   e. Not been used since Jan. 1984 _____
   f. Leakage prior to March 1, 1986 _____
   (The Installation must have evidence)

2. Support Function of Tank (relationship to building or support use of tank):
   POL GAS PUMP @ Building 5

3. Estimated Age (in years) 22 Date installed __/__/67

4. Tank Manufacturer (if known) _____

5. Estimated Total Capacity 6,000 gallons

6. Material of Tank Construction: (Mark one only)
   a. Steel X
   b. Concrete _____
   c. Fiberglass _____
   d. Unknown _____
   e. Other _____

7. Internal Protection: (Mark all that apply)
   a. Cathodic Protection _____
   b. Interior Lining (epoxy, etc) _____
   c. None _____
   d. Unknown X
   e. Other _____

8. External Protection: (Mark all that apply)
   a. Cathodic Protection _____
   b. Painted _____
   c. Asphaltic coating, etc. _____
   d. Fiberglass/Plastic Coated _____
   e. None _____
   f. Unknown X
   g. Other _____

9. Piping:

(Mark all that apply)

a. Bare Steel _____
b. Galvanized Steel _____
c. Fiberglass Reinforced Plastic _____
d. Cathodically Protected _____
e. Unknown X
f. Other _____

10. Changes/improvements to tank after installation (description and dates):

---

11. Substance Currently or Last Stored in Greatest Quantity by Volume: WATER AVGAS

(Mark all that apply) GRADE #1 #2 ETC.

a. Empty _____
b. Diesel Fuel _____
c. Kerosene _____
d. Gasoline X
e. Heating Oil _____
f. Used Oil ~~X~~

e. Name of principal CERCLA Substance _____
or..f. Chemical Abstract Service (CAS) No. _____
g. Indicate if a mixture of substances are/were stored _____
h. Unknown _____

12. Substance stored in past, if different from the current contents:

(Mark all that apply)

a. Diesel Fuel _____
b. Kerosene _____
c. Gasoline _____
d. Heating Oil _____
e. Used Oil _____

f. Name of principal CERCLA Substance _____
or..g. Chemical Abstract Service (CAS) No. _____
h. Indicate if a mixture of substances are/were stored _____
i. Unknown _____
j..Dates stored (if known) __/__/____ to __/__/____

13. Additional Information for Tanks Permanently Taken Out of Service:

a. Estimated date last used __/__/69
b. Estimated quantity remaining _____ (gal.)
c. Tank filled with inert material _____ (sand etc)

14. Estimated depth to the top of Tank (fill over tank) 3 ft

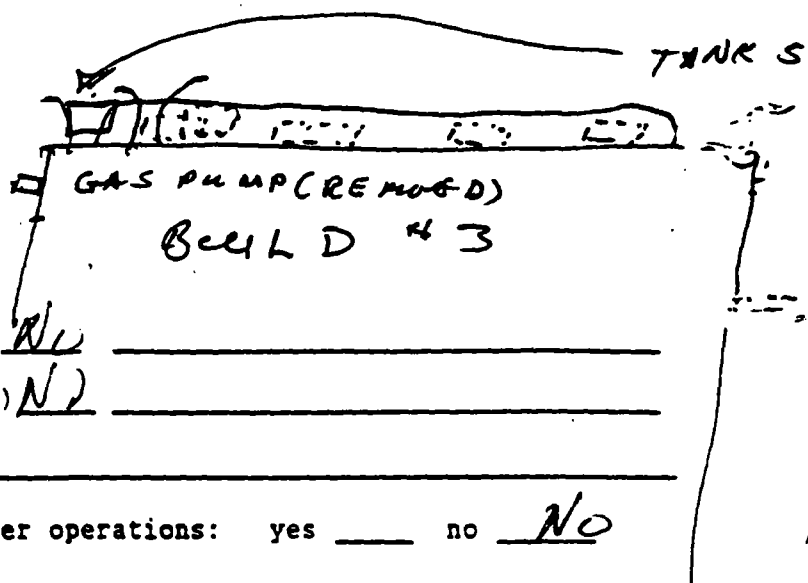
15. Tank testing for tightness and potential leakage (yes/no) _____

a. Method & Date : _____ __/__/__

b. Results : _____

B. FIELD DATA

1. Sketch of area/layout of tanks:



2. Containment Devices:
   a. Spill Control (yes/no, etc): NO _____
   b. Overflow Control (yes/no, etc) NO _____
   other description _____

3. Evidence of spills during transfer operations: yes ____ no NO
   a. Description/location spill(s) _____
   b. Photograph area and material (if evident) (yes/no) _____
   c. Quantity of material spilled (if known) _____ gallons

4. Evidence of past/current leakage (pipe system leaks too): yes/no NO
   If no, do not continue with this section.
   a. Type of substance (from #11,12 above) _____
   b. Cause of leak or spill _____
   c. Type of leak (tank, pipe, etc) _____
   d. Quantity of material leaked or spilled _____ gallons
   e. Dates related to leaks or spills _____
   f. Sources of records for leaks or spills _____
   g. Corrective actions taken _____
   h. Photograph area around tank and material (if evident: yes/no) _____

5. Evidence of soil, groundwater, or surface water contamination caused by UST: yes ____ no NO
   a. Describe contamination _____
   b. Quantity of material leaked/spilled _____ gallons

6. Compatability of tank with local conditions (examples include: overburden loads from traffic, encroachment of installation functions, etc. List anything that poses as a threat for damage or continued leaking of tank):

_____

7. Overburden conditions (concrete paving, thickness, etc.) 6" Sand Gravel & Rock 6" Concrete over Pipe

8. Depth to highest seasonal groundwater (average/each year): _____ ft ?

a. Source of information: _____

b. Copy/documentation of source obtained (yes/no) _____

9. Type of soil(s) in area around tank (from local SCS maps):

(Mark one)
a. Available from Base _____
b. Obtained from Base _____
c. Obtained from SCS X
d. Need to be obtained from SCS _____

10. Take photographs of unique features related to the tank, piping, fill locations, any evidence of settlement, and the surrounding area (access difficulties): (yes/no) Yes

11. Evidence of Installation correspondance with regulators (NOV's, etc.) on problem/leaking tanks:

a. Documentation of correspondance (yes/no) NO
(If no, do not continue with this section.)

b. Agency contacted _____

c. POC at Agency (& phone) _____

d. Requirements to rectify problem(s) (yes/no) _____

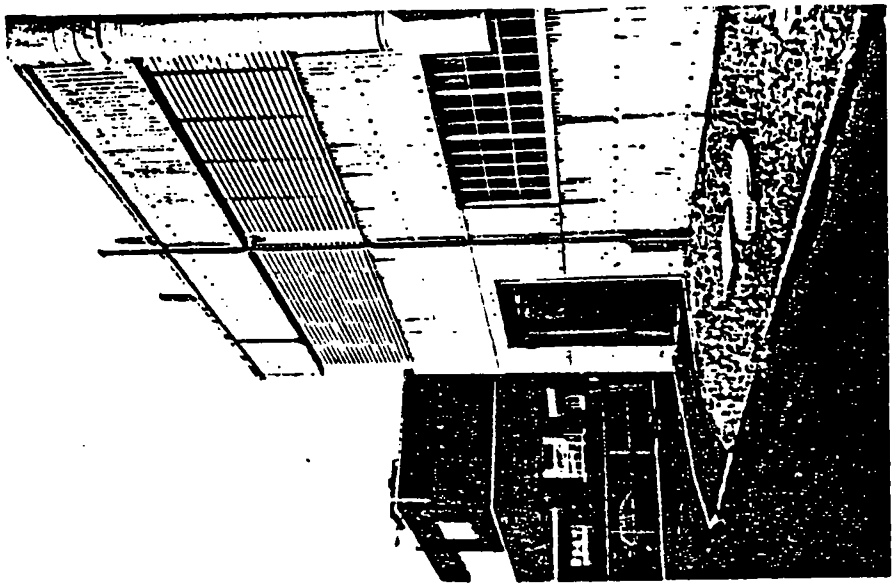
e. Documentation of correspondance obtained (yes/no) _____

12. Obtained copies of any Installation information on tank: (yes/no) Yes

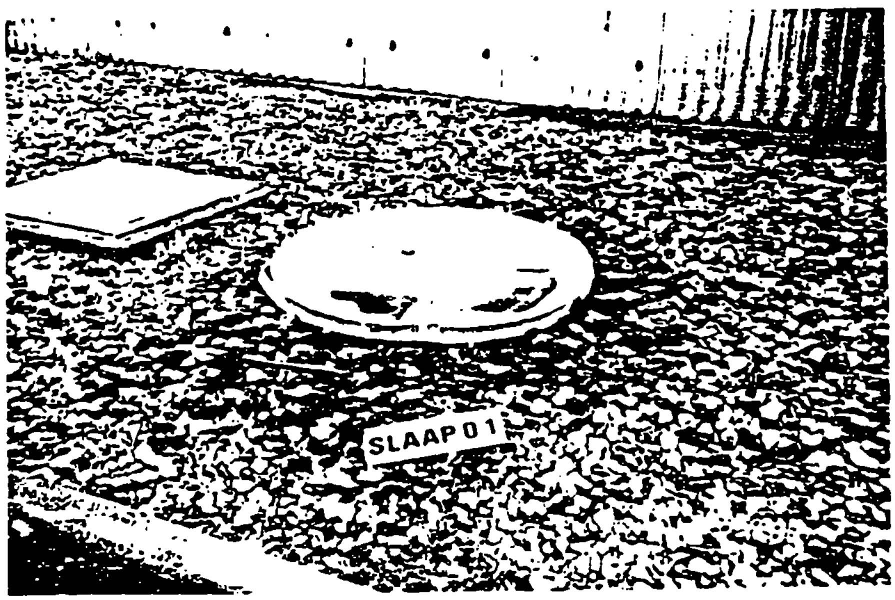
13. Indicate whether additional information is being sent and when its arrival is expected: NO

a. Date of/time until anticipated arrival _____

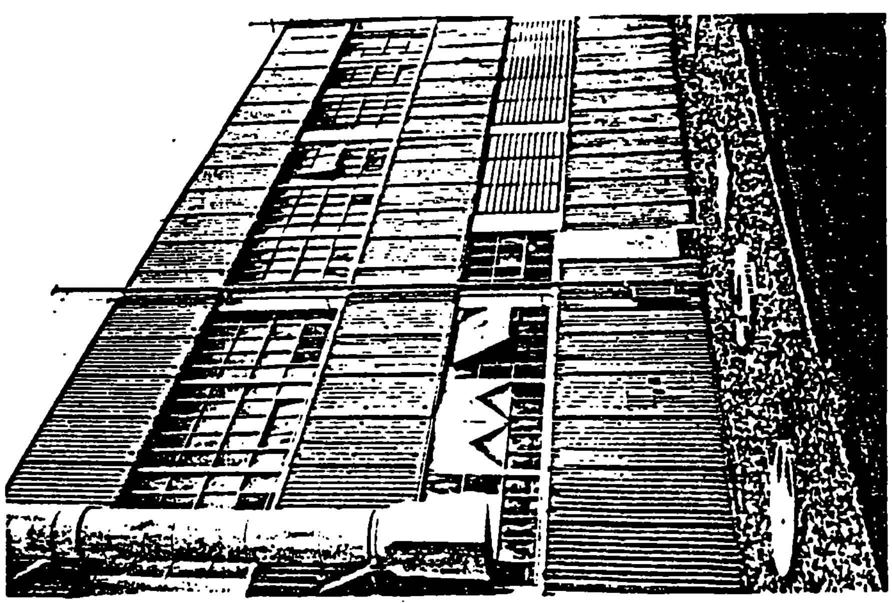
b. POC for information transmittal (phone) _____



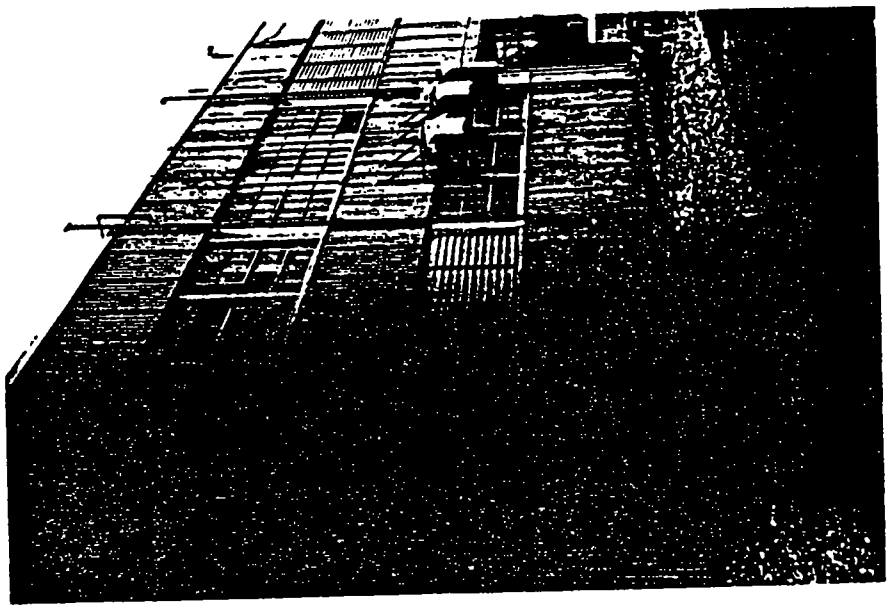
01



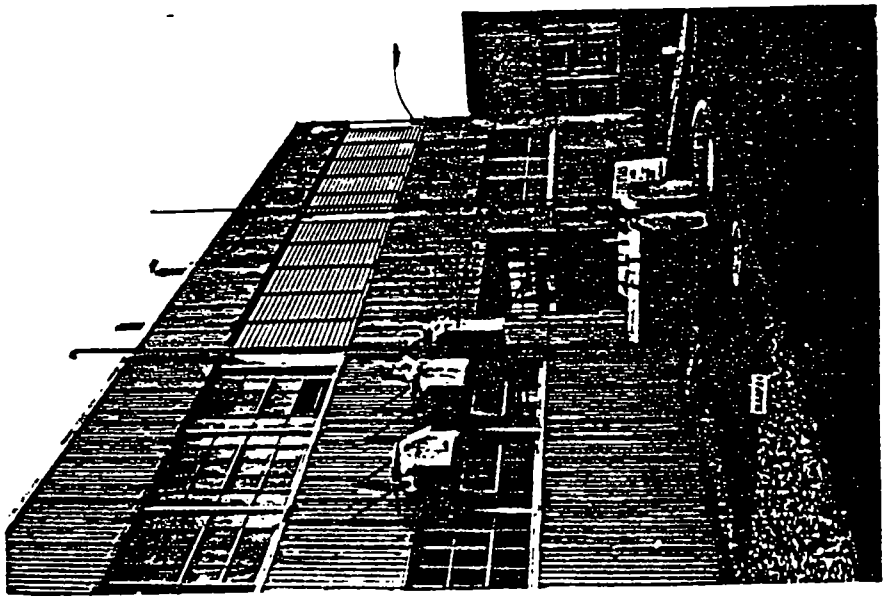
01



02



03



04

05

INVENTORY DATA SHEETS

SEE EPA FORM 7530-

INVENTORY SUMMARY SHEETS

R1C23:R5C23

	1	2	3	4	5	6	7
1	STL-UTS						
2	UST SURVEY	INSTALLATION	CURRENT	YEAR	VOLUME	CURRENT	TANK
3	TANK #	TANK #	STATUS	INSTALLED	GALLON	CONTENTS	MATERIAL
4	1		NIU	1940	15,000	?	S
5	2		NIU	1940	15,000	?	S
6	3		NIU	1940	15,000	?	S
7	4		NIU	1940	10,000	?	C
8	5		NIU	1940	6,000	WATER	S
9	6						
10	7						
11	8						
12	9						
13	10						
14	11						
15	12						
16	13						
17	14						
18	15						
19	16						
20	17						
21	18						
22	19						
23	20						
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25	22						
26	23						
27	24						
28	25						
29	26						
30	27						
31	28						
32	29						
33	30						
34	31						
35	32						
36	33						
37	34						
38	35						
39	36						

8	9	10	11	12	13	14
INTERNAL PROTECTION	EXTERNAL PROTECTION	TYPE OF PIPING	DEPTH OF TANK	YEAR OF LAST TEST	SPILL CONTROL	OVERFLOW CONTROL
U	U	U	3'	NO	NO	NO
U	U	U	3'	NO	NO	NO
U	U	U	3'	NO	NO	NO
U	U	U	1'	NO	NO	NO
U	U	U	3'	NO	NO	NO

	15	16	17	18	19	20
1						
2	EVIDENCE	EVIDENCE	GROUNDWATER	DEPTH OF	SOIL	PRIMARY
3	OF SPILLS	OF LEAKS	CONTAMINATION	GROUNDWATER	TYPE	REGULATOR
4	NO	NO	NO	10'	LOESS	STATE OF MISSOURI
5	NO	NO	NO	10'	LOESS	"
6	NO	NO	NO	10'	LOESS	"
7	NO	NO	NO	10'	LOESS	"
8	NO	NO	NO	10'	LOESS	"
9						
10						
11						
12						
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39						

	21	22	23	24	25
1					
2	DERA	REMARKS		LEGEND:	
3	ELIGIBILE		A - ASPHALT COATING		
4	YES		AN - ACID NEUTRALIZATION		
5	YES		C - CONCRETE		
6	YES				
7	YES		CF - CONTAMINATED FUEL		
8	YES		FO - FUEL OIL		
9			HO - HEATING OIL		
10			DS - DIESEL		
11			DWF - DOUBLE WALL FIBERGLASS		
12			DWS - DOUBLE WALL STEEL		
13			F - FIBERGLASS		
14			G - GASOLINE		
15			IU - IN USE		
16			NIU - NOT IN USE		
17			N84 - NOT IN USE SINCE PRIOR T		
18			R - REMOVED		
19			R/R - REMOVED AND REPLACED		
20			RAG - REPLACED WITH ABOVE GROU		
21			S - STEEL		
22			T - TIGHT		
23			U - UNKNOWN		
24			WO - WASTE OIL		
25			WO/S - WASTE OIL, SOLVENT		
26			WOS - WATER, OIL, SOLVENT		
27			WS - WASTE SOLVENT		
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					

O 1984

ND TANK

COMPLIANCE REQUIREMENTS

AND

COST ESTIMATE

COMPLIANCE REQUIRMENTS

All tanks on St. Louis AAP have not been used, prier to January 1984, and are elagable for closure or removal using DERA funds. The total estimated cost to remove all 5 tanks is $96,000.

OMAHA DISTRICT	COMPUTATION SHEET	CORPS OF ENGINEERS
PROJECT ST LOUIS AAP	SHEET NO.	OF
ITEM DERA TANK REMOVAL COSTS	BY JTD	DATE 09-21-82
	CHKD. BY	DATE

RECAP

TANK NO. (SLAAP UNDERSTOOD)

#1	16,600
#2	16,600
#3	16,600
#4	35,600
#5	10,200
TOTAL	95,600

US $96,000

UNDERGROUND STORAGE TANK

INVESTIGATION AND EVALUATION INVENTORY

ST LOUIS AAP

ST. LOUIS MISSOURI

SEPTEMBER 1989

APPENDICES

APPENDIX A

SCOPE OF WORK

NONE

APPENDIX B

PREVIOUS COMMENTS AND RESPONSES

NONE

APPENDIX E

TRIP REPORTS

SUBJECT: Trip Report, St. Louis AAP

1. INTRODUCTION:

a. Project: Underground Tank Survey (UTS)

b. Date of Trip: 21 August 1989

c. Omaha District Personnel: John T. Davis and James Nelson

d. Persons Contacted: Merle Humphries

e. Purpose of Trip: Survey underground tanks to provide data on which to base the report.

II. BACKGROUND: The Huntsville Division contracted with the Omaha District to survey all underground tanks at all Army Ammunition Storage Plants and all Army Depots to determine if any tanks are eligible to be removed with DERA funds.

III. SITE INSPECTION: There were 5 tanks on this facility - 3 quench oil, 1 sludge (for quench oil leavings) and one gasoline tank.

IV. CONCLUSIONS: All tanks have not been used since prior to January 1984, and should be removed using DERA funds.

JOHN T. DAVIS
Electrical Engineering Technician
Electrical Facilities Section

APPENDIX C

WRITTEN CORRESPONDENCE

John T. Davis 505-46-4940
James A. Nelson 508-54-2705

Itinerary:

Arrive Louisville, KY 12:35 p.m., 14 Aug 89.
Proceed to Indiana AAP by 2:30 p.m. for interview.
Exit interview 2:30 p.m., 16 Aug 89.

Arrive Lexington AAP (Also Service Bluegrass AAP) 7:30 A.M., 17 Aug 89.
Exit Interview 2:30 p.m., 18 Aug 89.

Arrive St. Louis, Mo 9:45 a.m. 21 Aug 89.
St. Louis AAP 12:30 p.m. for Interview.
Exit Interview 2:30 p.m. 22 Aug 89.

Arrive Newport 2:30 p.m. 23 Aug 89.
Exit Interview 10:00 a.m. 24 Aug 89.

APPENDIX D

RECORDS OF MEETINGS

RECORDS OF MEETINGS

1. Messrs. Davis and Nelson met Mr. Humphries 21 August and discussed the tanks and piping. All tanks have been unused since 1969 and are eligible for closure/removal using DERA funds.

2. Please note that the gasoline tank was overfilled with water to prevent any fumes from causing an explosion. This was a safety measure and not an indication the tank leaks.

3. Also, met with the county extension agent and obtained a soils map. Although, St. Louis is not in any county.

APPENDIX D

REGULATORY CORRESPONDENCE

NONE

APPENDIX E

PHONE CONVERSATION RECORDS

PHONE CONVERSATION RECORDS

1. On 3 August 1989, Mr. Davis contacted Mr. Merle Humphries at the St. Louis AAP. After explaining the requirements of the survey and discussing the quantity of tanks to be surveyed, set an approximate date of 21 August.

2. On 9 August 1989, again Mr. Davis contacted Mr. Humphries and verified the 21 August date and received instructions on how to locate the plant and motel accomodation recommendations.

APPENDIX H

COST ESTIMATE DATA AND CALCULATIONS

UNDERGROUND STORAGE TANK ESTIMATE

TANK: SLAAP-01 INSTALLATION: St. Louis AAP DATE: 09-13-89

DESCRIPTION OF WORK:	QTY	U/M	UNIT $	TOTAL $
Remove 120 Gallon Tank	____	EA	1,720.00	$_____
Remove 500 Gallon Tank	____	EA	2,121.00	$_____
Remove 1000 Gallon Tank	____	EA	3,152.00	$_____
Remove 5000 Gallon Tank	____	EA	7,468.00	$_____
Remove 15,000 Gallon Tank	1	EA	11,756.00	$ 14,096 =
Remove 20,000 Gallon Tank	____	EA	16,436.00	$_____
Remove 30,000 Gallon Tank	____	EA	20,690.00	$_____
Remove 34,000 Gallon Tank	____	EA	22,868.00	$_____
Remove Concrete Paving	____	SF	2.65	$_____
Remove Asphalt Paving	____	SF	1.92	$_____
Replace Concrete Paving	____	SF	6.52	$_____
SAND & ROCK COVER (REPLACEMENT)				500 =
Replace Asphalt Paving	____	SF	4.80	$_____
Remove Piping	100	LF	2.00	$ 200 =
Remove Asbestos from Pipes	____	LF	45.11	$_____
Remove Concrete Trench Walls	____	LF	7.95	$_____
Dewater	____	EA	1300.00	$_____
Tank Tightness Test	____	EA	800.00	$_____
Fill Containment (new)	____	EA	352.00	$_____
SHORING TO PROTECT BUILDING FOUNDATION				500 =
			TOTAL	$ 15,296
Contingency @ 10%				$ 1530 =
			SUB-TOTAL	$ 16,826
SIOH @ 5.5%				925 =
			SUB-TOTAL	$ 17,751 =
LOCATION ADJUSTMENT (.98 /1.05) = .933 = 93.3 %				$ 16,562 =
			TOTAL	$ 16,600 =

UNDERGROUND STORAGE TANK ESTIMATE

TANK: SLAAP-02 INSTALLATION: St. Louis AAP DATE: 09-15-89

DESCRIPTION OF WORK:	QTY	U/M	UNIT $	TOTAL $
Remove 120 Gallon Tank	____	EA	1,720.00	$_____
Remove 500 Gallon Tank	____	EA	2,121.00	$_____
Remove 1000 Gallon Tank	____	EA	3,152.00	$_____
Remove 5000 Gallon Tank	____	EA	7,468.00	$_____
Remove 15,000 Gallon Tank	____	EA	11,756.00	$ 14,096 =
Remove 20,000 Gallon Tank	____	EA	16,436.00	$_____
Remove 30,000 Gallon Tank	____	EA	20,690.00	$_____
Remove 34,000 Gallon Tank	____	EA	22,868.00	$_____
Remove Concrete Paving	____	SF	2.65	$_____
Remove Asphalt Paving	____	SF	1.92	$_____
Replace Concrete Paving SAND & ROCK COVER (REPLACEMENT)	____	SF	6.52	$_____ 500 =
Replace Asphalt Paving	____	SF	4.80	$_____
Remove Piping	100	LF	2.00	$ 200 =
Remove Asbestos from Pipes	____	LF	45.11	$_____
Remove Concrete Trench Walls	____	LF	7.95	$_____
Dewater	____	EA	1300.00	$_____
Tank Tightness Test	____	EA	800.00	$_____
Fill Containment (new) SHORING TO PROTECT BUILD. FOUNDATION	____	EA	352.00	$ 500 =
			TOTAL	$ 15,296 =
Contingency @ 10%				$ 1530 =
			SUB-TOTAL	$ 16826 =
SIOH @ 5.5%				$ 925 =
			SUB-TOTAL	$ 17,751
LOCATION ADJUSTMENT (.98 /1.05) = .933 = 93.3 %				$ 16,562 =
			TOTAL	$ 16,600 =

UNDERGROUND STORAGE TANK ESTIMATE

TANK: SHAAP-03 INSTALLATION: Shaw AAP DATE: 09-13-89

DESCRIPTION OF WORK:	QTY	U/M	UNIT $	TOTAL $
Remove 120 Gallon Tank	____	EA	1,720.00	$____
Remove 500 Gallon Tank	____	EA	2,121.00	$____
Remove 1000 Gallon Tank	____	EA	3,152.00	$____
Remove 5000 Gallon Tank	____	EA	7,468.00	$____
Remove 15,000 Gallon Tank	1	EA	11,756.00	$ 14,096 ≈
Remove 20,000 Gallon Tank	____	EA	16,436.00	$____
Remove 30,000 Gallon Tank	____	EA	20,690.00	$____
Remove 34,000 Gallon Tank	____	EA	22,868.00	$____
Remove Concrete Paving	____	SF	2.65	$____
SAND & Rock Cover REPLACEMENT				500 ≈
Remove Asphalt Paving	____	SF	1.92	$____
Replace Concrete Paving	____	SF	6.52	$____
Replace Asphalt Paving	____	SF	4.80	$____
Remove Piping	100	LF	2.00	$ 200 ≈
Remove Asbestos from Pipes	____	LF	45.11	$____
Remove Concrete Trench Walls	____	LF	7.95	$____
Dewater	____	EA	1300.00	$____
Tank Tightness Test	____	EA	800.00	$____
Fill Containment (new)	____	EA	352.00	$____
SHORING TO PROTECT BUILD FOUNDATION				5000 ≈
			TOTAL	$ 15,296 ≈
Contingency @ 10%				$ 1530 ≈
			SUB-TOTAL	$ 16,826 ≈
SIOH @ 5.5%				$ 925 ≈
			SUB-TOTAL	$ 17,757 ≈
LOCATION ADJUSTMENT (.98 /1.05) = .933 = 93.3 %				$ 16,562 ≈
			TOTAL	$ 16,600 ≈

UNDERGROUND STORAGE TANK ESTIMATE

TANK: SLAAP-04 INSTALLATION: St Louis AAP DATE: 09-13-91

DESCRIPTION OF WORK:	QTY	U/M	UNIT $	TOTAL $
Remove 120 Gallon Tank	____	EA	1,720.00	$____
Remove 500 Gallon Tank	____	EA	2,121.00	$____
Remove 1000 Gallon Tank	____	EA	3,152.00	$____
Remove 5000 Gallon Tank	____	EA	7,468.00	$____
Remove 10,000 Gallon Tank	1	EA	11,756.00	$ 11,756.00
Remove 20,000 Gallon Tank	____	EA	16,436.00	$____
Remove 30,000 Gallon Tank	____	EA	20,690.00	$____
Remove 34,000 Gallon Tank	____	EA	22,868.00	$____
Remove Concrete CURB & TOP	300	SF	2.65	$ 795.00
Remove Asphalt Paving	____	SF	1.92	$____
Replace Concrete CURB TOP. WITH Paving	300	SF	6.52	$ 1956.00
Replace Asphalt Paving	____	SF	4.80	$____
Remove Piping	200	LF	2.00	$ 400.00
Remove Asbestos from Pipes	____	LF	45.11	$____
Remove Concrete Trench Walls	____	LF	7.95	$____
Dewater	____	EA	1300.00	$____
Tank Tightness Test	____	EA	800.00	$____
Fill Containment (new)	____	EA	352.00	$____
SHORING TO PROTECT BUILDING FROM EXCAVATION			TOTAL	$ 32,911.00 400.00
Contingency @ 10%				$ 3291.00
			SUB-TOTAL	$ 36,202.00
SIOH @ 5.5%				$ 1991.00
			SUB-TOTAL	$ 38,193.00
LOCATION ADJUSTMENT (.98 /1.05) = .933 = 93.3%				$ 35,634.00
			TOTAL	$ 35,600.00

UNDERGROUND STORAGE TANK ESTIMATE

TANK: SLAAP-05 INSTALLATION: St Louis AAP DATE: 09-13-89

DESCRIPTION OF WORK:	QTY	U/M	UNIT $	TOTAL $
Remove 120 Gallon Tank	____	EA	1,720.00	$_____
Remove 500 Gallon Tank	____	EA	2,121.00	$_____
Remove 1000 Gallon Tank	____	EA	3,152.00	$_____
Remove 6000 Gallon Tank	____	EA	7,468.00	$ 8,500 E
Remove 10,000 Gallon Tank	____	EA	11,756.00	$_____
Remove 20,000 Gallon Tank	____	EA	16,436.00	$_____
Remove 30,000 Gallon Tank	____	EA	20,690.00	$_____
Remove 34,000 Gallon Tank	____	EA	22,868.00	$_____
Remove Concrete Paving	____	SF	2.65	$_____
Remove Asphalt Paving	____	SF	1.92	$_____
Replace Concrete Paving SAND & GRAVEL CONCRETE-LOCAL REQUIRES	____	SF	6.52	$ 450 E
Replace Asphalt Paving	____	SF	4.80	$_____
Remove Piping	100	LF	2.00	$ 200 E
Remove Asbestos from Pipes	____	LF	45.11	$_____
Remove Concrete Trench Walls	____	LF	7.95	$_____
Dewater	____	EA	1300.00	$_____
Tank Tightness Test	____	EA	800.00	$_____
Fill Containment (new) SHORING TO PROTECT BUILDING FROM DAMAGE	____	EA	352.00	$ 250 E
			TOTAL	$ 9,400 E
Contingency @ 10%				$ 940 E
			SUB-TOTAL	$ 10340 E
SIOH @ 5.5%				$ 569
			SUB-TOTAL	$ 10,909 E
LOCATION ADJUSTMENT (.98 /1.05) = .933 = 93.3 %				$ 10,178 E
			TOTAL	$ 10,200 E

APPENDIX J

API PUBLICATION 1604

Removal and Disposal of Used Underground Petroleum Storage Tanks

Marketing Department

API RECOMMENDED PRACTICE 1604
SECOND EDITION, DECEMBER 1987

American
Petroleum
Institute

March 6, 1989

SUPPLEMENT TO RECOMMENDED PRACTICE 1604 ON REMOVAL AND DISPOSAL OF USED UNDERGROUND PETROLEUM STORAGE TANKS (Second Edition, December 1987)

On September 23, 1988, the United States Environmental Protection Agency issued its Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST). These standards, which will be Part 280 of Volume 40 of the Code of Federal Regulations, were published in Volume 53 of the Federal Register at pages 37194-212.

The EPA Technical Standards deal with removal and disposal of used USTs, among other topics. Consequently, some changes in Recommended Practice 1604 are called for. This Supplement contains revisions that will be included in the next edition.

SPECIFIC REVISIONS TO RECOMMENDED PRACTICE 1604

Unnumbered Page -- Foreword

Delete the third paragraph in the Foreword and substitute the following material:

> On September 23, 1988, the United States Environmental Protection Agency issued its Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST). These standards, which will be Part 280 of Volume 40 of the Code of Federal Regulations, were published in Volume 53 of the Federal Register at pages 37194-212. Furthermore, legislation and regulations on all aspects of UST management are under active development at state and local levels. These levels may have requirements other than those specified in the EPA Technical Standards, and the appropriate government agencies should be consulted about regulations that apply in the geographic area of interest before any action suggested by this Recommended Practice is taken. When used in this document, the term "implementing agency" means EPA or the designated state or local agency responsible for carrying out an approved UST program.
>
> This Recommended Practice is based upon the experience of knowledgeable members of the petroleum industry. In some respects it may be more stringent than the requirements imposed by the Technical Standards. However, the Recommended Practice does not attempt to cover all of the subjects covered by the EPA Technical Standards. Furthermore, while substantial effort has been made to ensure that none of the recommendations contravene the requirements of the Technical Standards, API is not undertaking to interpret the Standards and cannot guarantee that its recommendations are completely in accord. Nor is any representation made that these recommendations conform with any requirements imposed by state and local agencies.
>
> This edition of API Recommended Practice 1604 supersedes API Recommended Practice 1604, Second Edition, December 1987. The EPA Technical Standards provide that Recommended Practice 1604 can be used as a guide to compliance with EPA's requirements governing closure of USTs. According to EPA, an owner or operator conforms with this provision of the Standards if it uses the 1987 edition, which was in force when the Standards became final. However, an owner or operator who uses this

amended version will also be meeting the requirements of the 1987 edition, and EPA encourages the use of the most recent version.

Table of Contents

Change SECTIONS 3 and 4 to read as follows:

SECTION 3 - PERMANENT CLOSURE AND CHANGE OF SERVICE
3.1 General Requirements
3.2 Disposal in Place
3.3 Removal of Underground Tanks
3.4 Change of Service

Renumber SECTIONS 5, 6, and 7 to SECTIONS 4, 5, and 6.

Page 2

In subsection 1.3.1.1 Benzene, delete all material starting with the fourth sentence in the paragraph ("The American Conference . . . ") to the end of the paragraph and substitute the following:

The Occupational Safety and Health Administration (OSHA) imposes limits on occupational exposure. See 29 C.F.R. 1910.1000, Table Z-2, and 1910.1028.

Page 3

Delete the material under Section 2.1 Applicability and substitute the following:

An UST is considered temporarily out of service if it is:
a. Idle but will be returned to service;
b. Awaiting abandonment in place; or
c. Awaiting removal.
An UST that meets EPA's standards for new tanks or that has been upgraded in accord with EPA requirements can remain in the status of "temporarily out of service" indefinitely. An UST that does not meet EPA standards must be permanently removed from service after 12 months unless the implementing agency grants an extension. A site assessment must be completed before an extension can be applied for.

Add the following sentence to Section 2.2 Securing Tank Systems, subsection b.2.:

(If more than 2.5 centimeters (1 inch) of residue or more than 0.3 percent of the capacity of the system remain in

the tank, then release detection measures must be continued.)

Add a new major title SECTION 3 -- PERMANENT CLOSURE AND CHANGE OF SERVICE, and insert the following sections:

3.1 General Requirements

3.1.1 Applicability

Permanent closure of an UST can take place through abandonment in place or removal from the ground. A change of service (that is, conversion of the UST to storage of a non-regulated substance) should also be subject to many of the safeguards that apply to permanent closure.

3.1.2 Notification

The implementing agency must be notified at least 30 days before permanent closure or change of service is begun.

3.1.3 Site Assessment

Following notification, but before closure or change of service is completed, a site assessment must measure for the presence of a release at those places where contamination is most likely to be found. If the UST has been subject to release detection in the form of vapor monitoring, ground water monitoring, interstitial monitoring (in the form of monitoring between the walls of double wall tanks or observation wells), and if no release is indicated, then further site assessment is not necessary.

3.1.4 Corrective Action

If the site assessment indicates that a release(s) has occurred, then appropriate further evaluation and corrective action must be undertaken. See API Publication 1628.

3.1.5 Recordkeeping

Records demonstrating compliance with closure requirements must be maintained. The results of any site assessment of the excavation must be maintained for at least three years. These records can be kept by the owners and operators who took the tank out of service, by the current owners of the site, or by mailing the records to the implementing agency.

Change "SECTION 3 -- DISPOSAL IN PLACE" to "Section 3.2 Disposal in Place," and renumber the subsections accordingly.

Page 4

Insert the following material after the first sentence of present subsection 3.2.4 [renumbered to be 3.2.2.4]:

> During removal of liquids or residues from a tank it is likely that air will enter the tank, and may bring the tank atmosphere into the flammable range. Extra care should be taken during removal operations. For a complete description of safety precautions, refer to API Publication 2015.

Page 5

Change "SECTION 4 -- REMOVAL OF UNDERGROUND TANKS" to "Section 3.3 Removal of Underground Tanks," and renumber the subsections accordingly.

Page 7

Delete the present section 4.4.3 [renumbered to be 3.3.4.3] and substitute the following:

> Present 4.4.3 [Renumbered to be 3.3.4.3] When an existing USTS is partially or totally removed, a small amount of contaminated backfill may be encountered. Backfill can be contaminated by minor spills and drips during previous operation of the facility or by minor spills and drips during removal of equipment, despite efforts to drain and pump product from the equipment before removal. If severe contamination has occurred, local environmental officials and/or fire officials should be notified. Local officials may require isolation and special handling and/or disposal of contaminated backfill materials (see API Publication 1628). The implementing agency should be consulted about any requirements concerning notification, site assessment, or corrective action.

Page 8

Insert a new "Section 3.4 Change of Service" and add the following material:

> 3.4.1 Before a change of service, the UST must be emptied and cleaned.

3.4.2 Any new service should be compatible with the former service. The precautions described in sections [old numbers] 4.4.4 and 4.4.5, above, should be observed.

Pages 8-9

Renumber SECTIONS 5, 6, and 7 as SECTIONS 4, 5, and 6, and renumber subsections accordingly.

Removal and Disposal of Used Underground Petroleum Storage Tanks

API RECOMMENDED PRACTICE 1604
SECOND EDITION, DECEMBER 1987

American Petroleum Institute
1220 L Street, Northwest
Washington, D.C. 20005

FOREWORD

Underground storage tank systems that have held flammable or combustible liquids should be handled with extreme care during disposal in place, removal, storage, or disposal off site. This is particularly true of underground storage tanks at motor vehicle refueling facilities which are most frequently used for storage of motor fuel or other petroleum products.

The purpose of this recommended practice is to provide procedures for the disposal in place, removal, storage, and the off-site disposal or sale of used underground tanks that have contained flammable or combustible liquids. Although this guide specifically addresses underground storage tank systems at service station facilities, the principles outlined may be applied to similar systems used at other petroleum facilities.

At the time this recommended practice was written, legislation and regulations related to the operation, maintenance, disposal, and removal of underground petroleum storage systems were under development at the federal, state, and municipal levels. The appropriate government agencies should therefore be consulted about regulations that apply to the geographic area of interest before any action suggested in this recommended practice is taken. API will revise this recommended practice from time to time in an effort to ensure consistency with all applicable federal regulations. This edition of API Recommended Practice 1604 supersedes API Publication 1604, *Recommended Practice for the Abandonment and Removal of Used Underground Service Station Systems* (First Edition, 1981) in its entirety.

Suggested revisions are invited and should be submitted to the Director of the Marketing Department, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005.

CONTENTS

Removal and Disposal of Used Underground Petroleum Storage Tanks

SECTION 1—GENERAL

1.1 Introduction

Underground petroleum storage systems that are no longer needed or suitable for product storage must be properly disposed in place or removed in order to avoid future safety or environmental hazards. Because of the nature of the flammable or combustible liquids that are stored in these tanks, hazardous conditions may arise in the work area during disposal in place or removal and subsequent handling of tanks. For this reason, all personnel involved in the procedures outlined in this recommended practice should be familiar with the potential hazards, and be knowledgeable in the appropriate health and safety measures needed to ensure a safe working environment.

1.2 Scope and Purpose

1.2.1 This publication recommends procedures for the disposal in place, removal, storage, and off-site disposal of underground storage tank systems that have contained flammable or combustible fluids. In general, it outlines requirements, procedures, and operating conditions to be followed by contractors, engineers, or other individuals who may be involved in these practices. While this recommended practice specifically addresses underground petroleum storage tank systems at service station facilities, the principles outlined may be applied to similar systems used at other petroleum storage facilities. All such work must be accomplished in accordance with federal, state, and local requirements as well as accepted safety standards. Before initiating work, the appropriate government agencies should be consulted concerning applicable regulatory and permit requirements.

1.2.2 All applicable permits must be obtained prior to beginning any work. Where required, contractors must be approved by local authorities. Contractors, subcontractors, and their employees responsible for tank abandonment or removal should be familiar with: (a) all applicable safety rules and regulations, (b) the use of equipment and procedures for testing and vapor-freeing tanks, (c) the handling and disposal of the types of wastes likely to be encountered, and (d) the applicable sections of the publications referenced in 1.4.

1.2.3 The procedures outlined in this recommended practice can be carried out without the need to enter the tank. Should tank entry be desired, the procedures outlined in API Publications 2015, 2015A, and 2217 and Recommended Practice 1631 should be followed.

1.3 Special Precautions

During the course of underground storage tank removal or in place disposal, workers may be exposed to petroleum hydrocarbon liquids, vapors, or wastes. The precautions in 1.3.1 and 1.3.2 should be observed by all individuals engaged in the procedures discussed in this recommended practice.

1.3.1 TOXICITY CONSIDERATIONS: PETROLEUM SUBSTANCES

Users should be aware of appropriate health precautions. When high concentrations of petroleum hydrocarbon vapors are inhaled, symptoms of intoxication may result. These symptoms, ranging from simple dizziness to excitement or unconsciousness, are similar to those produced by alcohol or anesthetic gases. If such effects occur, the individual should be removed to fresh air. For minor effects of exposure, breathing fresh air or oxygen results in rapid recovery. If breathing has stopped, artificial respiration should be applied promptly. Medical attention should be obtained as soon as possible. Paragraphs 1.3.1.1 and 1.3.1.2 contain special toxicity considerations for benzene and tetraethyl lead, which may be present in petroleum products or wastes found in underground storage tanks. Care should be exercised to minimize exposure to these substances when they are present during the handling of used underground petroleum storage tanks.

WARNING: Tests have shown that prolonged or repeated exposure to some petroleum substances, in liquid or vapor form, may cause serious illness, including cancer, in laboratory animals. Although the significance of these test results to human health is not fully understood, exposure to petroleum substances should be minimized. The following health precautions are suggested:

a. Avoid skin contact and inhaling vapors.

b. Keep petroleum liquids away from eyes, skin, and mouth; they can be harmful or fatal if inhaled, absorbed through the skin, or ingested.
c. Use soap and water or waterless hand cleaner to remove any petroleum product that contacts skin. Do not use gasoline or similar solvents to remove oil and grease from skin.
d. Promptly wash petroleum-soaked clothes and avoid using soaked leather goods. Properly dispose of rags.
e. Keep work areas clean and well ventilated.
f. Clean up spills promptly.

1.3.1.1 Benzene

High occupational exposures to benzene have been associated with various human blood disorders, including an increased risk of leukemia. Very high levels have also been known to affect the central nervous system. Benzene administered by mouth has induced cancer in laboratory animals in long-term tests. Benzene is rapidly absorbed through the skin. The American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) for benzene is 1-part-per-million time-weighted average, with a short term exposure limit of 25 parts-per-million (the latter is designated for deletion in 1986 or 1987). The Occupational Safety and Health Administration (OSHA) 8-hour time-weighted average for benzene is 10 parts-per-million with an acceptable ceiling concentration of 25 parts-per-million and an acceptable peak of 50 parts-per-million for 10 minutes (29 CFR 1910.1000, Table Z-2). OSHA conducted a rulemaking in 1986 with the intent to revise this standard. The latest OSHA *Occupational Safety and Health Standards* should be consulted to determine the current TLV.

1.3.1.2 Tetraethyl Lead

This organic form of lead can cause diseases of the central and peripheral nervous system, the kidney and the blood. Skin absorption of this compound is a major route of entry into the body. The ACGIH time-weighted average is 0.1 milligrams per cubic meter for general room air. The TLV in OSHA's *Occupational Safety and Health Standards* (29 CFR 1910.1000, Table Z-1) is 0.075 milligrams per cubic meter.

1.3.2 FLAMMABILITY AND COMBUSTIBILITY CONSIDERATIONS

1.3.2.1 Flammable or combustible vapors are likely to be present in the work area. The concentration of vapors in the tank, the excavation, or the work area may reach the flammable (explosive) range before venting is completed and a safe atmosphere is reached. Therefore, precautions must be taken to: (a) eliminate all potential sources of ignition from the area (for example, smoking materials, nonexplosion-proof electrical and internal combustion equipment), (b) prevent the discharge of static electricity during venting of flammable vapors, and (c) prevent the accumulation of vapors at ground level. Refer to API Publication 2015 and Recommended Practice 2003 for general precautionary measures to follow during the vapor-freeing procedure.

1.3.2.2 A combustible gas indicator (CGI) should be used to check for hazardous vapor concentrations (see 4.3). All open flame and spark-producing equipment within the vapor hazard area should be shut down. Electrical equipment (for example, pumps and portable hand tools) used in the area must be explosion-proof in accordance with NFPA 70B Class I, Division I, Group D or otherwise approved for use in potentially explosive atmospheres.

1.4 Referenced Publications

Portions of the following documents contain information regarding various engineering and safety procedures that may be applicable to underground storage tank removal or disposal.

API	
Bull 1628	*Underground Spill Cleanup Manual*
RP 1631	*Interior Lining of Underground Storage Tanks*
RP 2003	*Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*
Publ 2015	*Cleaning Petroleum Storage Tanks*
Publ 2015A	*A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning* (Supplement to API Publ 2015)
Publ 2217	*Guidelines for Confined Space Work in the Petroleum Industry*
Publ 2219	*Safe Operating Guidelines for Vacuum Trucks in Petroleum Service*
NFPA[1]	
327	*Standard Procedure for Cleaning or Safeguarding Small Tanks and Containers*
70B	*Electrical Equipment Maintenance*

[1]National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

OSHA[2]

Occupational Safety and Health Standards (29 CFR 1910.1000)

EPA[3]

General Regulations for Hazardous Waste Management (40 CFR 260)

Regulations for Identifying Hazardous Waste (40 CFR 261)

Regulations for Hazardous Waste Generators (40 CFR 262)

Underground Storage Tanks Regulations (40 CFR 280.11, 280.22)

SECTION 2—TEMPORARILY OUT OF SERVICE

2.1 Applicability

Underground petroleum storage tank systems are considered temporarily out of service if they are: (a) idle but will be returned to service within one year, (b) are awaiting abandonment in place, or (c) are awaiting removal.

2.2 Securing Tank Systems

Tanks temporarily out of service must be properly secured for the period they will be out of service. Tanks may be considered properly secured if processed as follows:

a. Observe all special precautions described in 1.3 through 1.3.2.2.

b. Remove stored product from the tank using one of the following methods:

1. Drain all product lines into the tank, then remove all liquids from the tank.
2. Remove all flammable or combustible liquids with the exception of a sufficient quantity (approximately four inches) to assure a saturated vapor space.
3. When high water table or flooding conditions exist, remove all stored liquid and ballast the tank by filling with water.

c. Cap the fill pipe, gauge pipe, tank truck vapor recovery fitting, and vapor return. Secure the tank against tampering.

d. Cap the product lines at the service station island, or elsewhere if the pumps are removed, or leave the pumps connected and locked. Disconnect electric power to the pumps.

e. Leave the vent line open.

f. Consult the appropriate local, state, or federal agencies concerning regulatory notification requirements.

SECTION 3—DISPOSAL IN PLACE

3.1 Criteria for Disposal in Place

3.1.1 This section describes a safe method for the in place disposal of underground tanks. Removal of the tank is preferred (see Section 4). Disposal of the tank in place should be considered in the following circumstances: (a) because of the tank location adjacent equipment or structures may be damaged or weakened if the tank is removed, (b) removal may be physically impossible, or (c) removal may incur excessive costs. A determination of whether to dispose of a tank in place or to remove it will depend upon: (a) local regulations which may prohibit abandonment in place, (b) the location of the facility and tank, (c) the availability of equipment, and (d) cost. Additional considerations include the length of service the equipment has provided and its reuse or salvage value.

3.1.2 The federal *Resource Conservation and Recovery Act* (RCRA) (40 CFR 260-265) places restrictions on disposal of certain residues that may be present in some underground storage tanks. Residues from tanks that have held leaded gasoline should be treated with extreme caution. Lead compounds and other residues in the tank may be classified as hazardous wastes. All liquids and residues removed from the tank should be handled in accordance with appropriate federal, state, and local regulations. Product removed from the tank can usually be reused or recycled.

3.2 Procedures for Disposal in Place

3.2.1 Tanks may be effectively and safely disposed in place by using the procedures in 3.2.2 through 3.2.11.

[2]Occupational Safety and Health Administration, U.S. Department of Labor, Washington, D.C. 20402.
[3]U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460.

3.2.2 Observe the special precautions described in 1.3 through 1.3.2.2.

3.2.3 Drain product piping into the tank, being careful to avoid any spillage to the excavation area. Disconnect product piping from the tank, and cap or remove the piping.

3.2.4 Remove liquids and residues from the tank by using explosion-proof or air-driven pumps. Pump motors and suction hoses must be bonded to the tank or otherwise grounded to prevent electrostatic ignition hazards. It may be necessary to use a hand pump to remove the last few inches of liquid from the bottom of the tank. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck must be vapor-free. The truck should be located upwind from the tank and outside the path of probable vapor travel. The vacuum pump exhaust gases should be discharged through a hose of adequate size and length downwind of the truck and tank area. See API Publication 2219 for vacuum truck operating and safety practices.

3.2.5 Excavate to the top of the tank.

3.2.6 Remove the drop tube, fill pipe, gauge pipe, vapor recovery truck connection, submersible pumps, and other tank fixtures. Cap or remove all non-product lines, such as vapor recovery lines, except for the vent line. The vent line should remain connected until the tank is purged (see 4.2.2 through 4.2.7). Temporarily plug all other tank openings.

3.2.7 Purge the tank of flammable vapors. This may be accomplished using methods outlined in 4.2.2 through 4.2.7. Vent all vapors a minimum of 12 feet above grade and 3 feet above any adjacent roof lines. Monitor the tank for flammable vapor with a combustible gas indicator until the tank atmosphere has been brought to less than 20 percent of the lower flammable limit (see 4.3).

3.2.8 One or more holes may be cut in the tank top if existing tank openings are not adequate for introduction of the inert material to be used to fill the tank.

3.2.9 Proceed to introduce a suitable solid inert material through openings in the top of the tank. It is important to fill the tank as full as possible with the sand or other inert material. The procedures in 3.2.9.1 through 3.2.9.3 are intended to minimize any surface settling subsequent to disposal of the tank in place.

3.2.9.1 Sand will flow readily and is generally available. Any kind of sand is suitable if it is free of rocks, which might limit leveling-out in the tank. The sand may be introduced dry as long as it flows in freely. When the sand cone nears the top of the tank, the sand can be washed into the tank with a nominal amount of water and puddled to cause it to flow to the ends. The use of larger amounts of water should be avoided since the tank might be filled with water before it is filled with sand.

3.2.9.2 Almost complete filling of the tank can be achieved by using a combination of sand and earth. Fill the tank with sand to approximately 80 percent of calculated capacity. Mix soil and water to make a free-flowing mud and pour the mixture into the tank opening. Puddle the mixture until the tank is full and overflows the fill opening.

3.2.9.3 Other types of inert materials, slurries, or expandable materials such as polyurethane-type foams may be used when approved by regulatory officials.

3.2.10 After the tank is filled with an inert material, all tank openings should be plugged or capped unless it was necessary to cut open the tank top (see 3.2.8).

3.2.11 Disconnect and cap or remove the vent line.

3.3 Recordkeeping

3.3.1 When underground tanks are disposed in place, the owner of the tank should keep a permanent record of the tank location, the date of disposal in place, and the method of conditioning the tank for disposal. All local, state, and federal regulatory requirements for tank disposal/closure and notification must be observed.

3.3.2 It is recommended that the tank owner inform a potential buyer of the presence of abandoned underground tanks when properties are sold. A property owner should also be informed at the termination of the property lease. In some areas this may be a regulatory requirement. It may be desirable to obtain an acknowledgement or a release from the property owner.

SECTION 4—REMOVAL OF UNDERGROUND TANKS

4.1 Preparation

4.1.1 Observe the special safety precautions in 1.3 through 1.3.2.2.

4.1.2 Drain product piping into the tank, being careful to avoid any spillage. Cap or remove product piping.

4.1.3 Remove residues and liquids from the tank as described in 3.2.4. Also observe the restrictions in 3.1.2.

4.1.4 Excavate to the top of tank.

4.1.5 Remove the fill pipe, gauge pipe, vapor recovery truck connection, submersible pumps, and other tank fixtures. Remove the drop tube, except when it is planned to vapor-free the tank by using an eductor as in 4.2.5. Cap or remove all non-product lines, such as vapor recovery lines, except the vent line. The vent line should remain connected until the tank is purged. Temporarily plug all other tank openings so that all vapors will exit through the vent line during the vapor-freeing process.

4.2 Purging

4.2.1 Remove flammable vapors by one of the methods described in 4.2.2 through 4.2.7, or as required by local codes. These methods provide a means for temporary vapor-freeing of the tank atmosphere. However, it is important to recognize that the tank may continue to be a source of flammable vapors even after following the vapor-freeing procedures described in 4.2.2 through 4.2.7. For this reason, caution must always be exercised when handling or working around tanks that have stored flammable or combustible liquids. Before initiating work in the tank area or on the tank, a combustible gas indicator should be used to assess vapor concentrations in the tank and work area.

4.2.2 Vent all vapors from the tank at a minimum height of 12 feet above grade and 3 feet above any adjacent roof lines until the tank is purged of flammable vapors. The work area should be free from sources of ignition (see 1.3.2).

4.2.3 Flammable and combustible vapors may be purged with an inert gas such as carbon dioxide (CO_2) or nitrogen (N_2). This method should not be utilized if the tank is to be entered for any reason, as the tank atmosphere will be oxygen deficient. The inert gas should be introduced through a single tank opening at a point near the bottom of the tank at the end of the tank opposite the vent. When inert gases are used, they should be introduced under low pressure to avoid the generation of static electricity. When using CO_2 or N_2, pressures in the tank should not exceed 5 pounds per square inch gauge.

CAUTION: The process of introducing compressed gases into the tank may create a potential ignition hazard as the result of the development of static electrical charges. The discharging device must therefore be grounded. Explosions have resulted from the discharging of CO_2 fire extinguishers into tanks containing a flammable vapor-air mixture. CO_2 extinguishers should not be used for inerting flammable atmospheres.

4.2.4 If the method described in 4.2.3 is not practical, the vapors in the tank may be displaced by adding solid carbon dioxide (dry ice) to the tank in the amount of at least 1.5 pounds per 100 gallons of tank capacity. The dry ice should be crushed and distributed evenly over the greatest possible area in the tank to promote rapid evaporation. As the dry ice vaporizes, flammable vapors will flow out of the tank and may surround the area. Therefore, where practical, plug all tank openings except the vent after introducing the solid CO_2 and continue to observe all normal safety precautions regarding flammable or combustible vapors. Make sure that all of the dry ice has evaporated before proceeding.

CAUTION: Skin contact with dry ice may produce burns.

4.2.5 Flammable vapors may be exhausted from the tank by one of two methods of tank ventilation listed below:

a. Ventilation using an eductor-type air mover usually driven by compressed air is illustrated in Figure 1. The eductor-type air mover must be properly bonded to prevent the generation and discharge of static electricity. When using this method, the fill (drop) tube should remain in place to ensure ventilation at the bottom of the tank. Tanks equipped with fill (drop) tubes that are not removable should be purged by this method. An eductor extension shall be used to discharge vapors a minimum of 12 feet above grade.

b. Ventilation with a diffused air blower is illustrated in Figure 2. When using this purging method, it is imperative that the air-diffusing pipe is properly bonded to prevent the discharge of a spark. Fill (drop) tubes must be removed to allow proper diffusion of the air in the tank. Air supply should be from a compressor that has been checked to ensure a clean air supply and is free

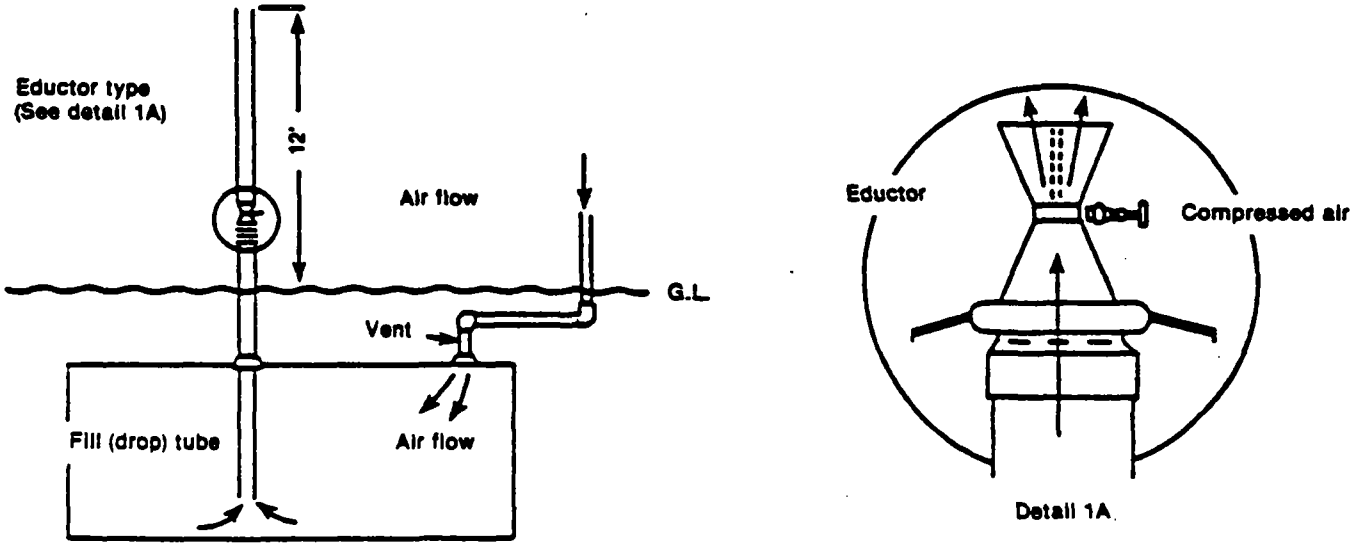
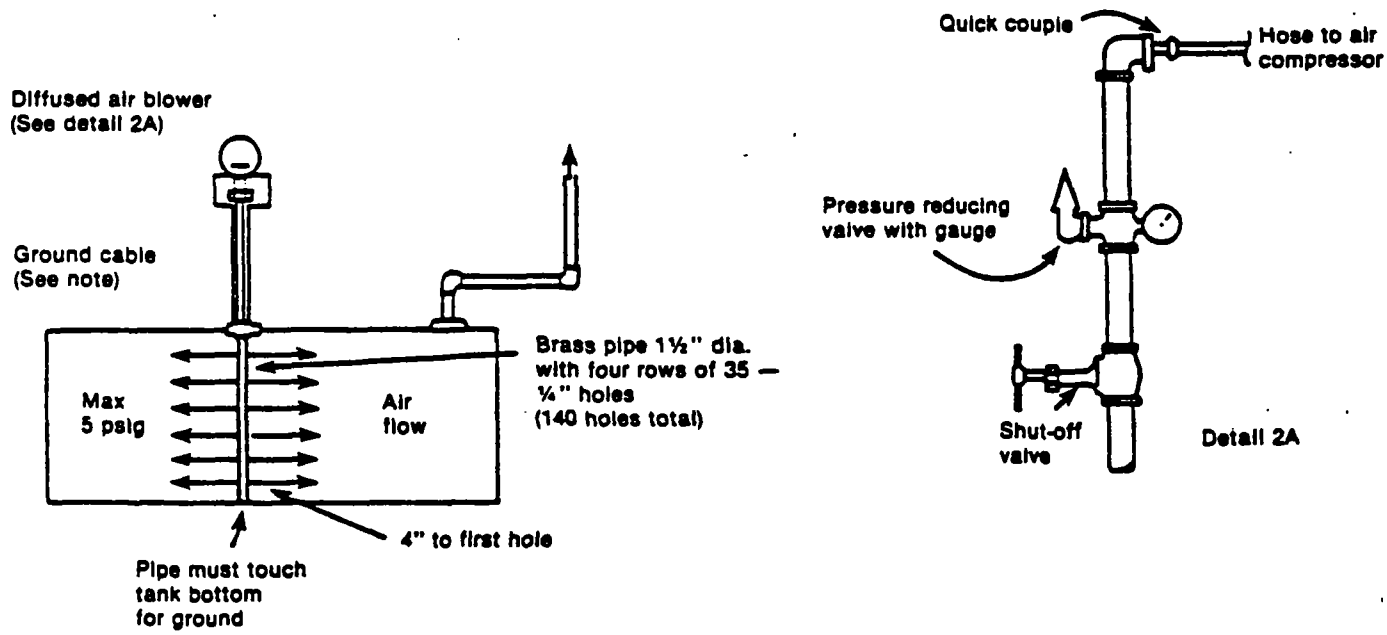


Figure 1—Eductor-Type Air Mover



Note: Ground cable brazed to pipe must be clamped to fill pipe. Use 12 gauge ground wire from fill pipe to water pipe or ground rod.

Figure 2—Diffused Air Blower

from volatile vapors. Air pressure in the tank must not exceed 5 pounds per square inch gauge.

4.2.6 One of the safest and simplest methods for vapor-freeing a tank is to fill the tank with water. However, in certain areas, regulatory requirements for treatment/disposal of water used in the vapor-freeing process may make this method cost-prohibitive. Before employing the method described in 4.2.6.1 through 4.2.6.3, consult local regulations.

4.2.6.1 Fill the tank with water until the floating product nears the fill opening. Remove the floating product and place it in a suitable container for proper disposal. Care should be exercised to ensure that neither product nor water is spilled into the tank excavation.

4.2.6.2 In the process of filling the tank with water, flammable vapors will be expelled through both the vent and fill openings, but primarily at the fill opening. Normal safety precautions should be observed. To minimize this escape of vapor through the fill opening, the opening may be temporarily capped.

4.2.6.3 When the tank is free of vapor, pump out the water and dispose of it in accordance with local regulations.

4.2.7 Steam can be used to clean and vapor-free a tank. However, a large static charge can build up on the nozzle of the steam jet. Insulated objects on which the steam impinges can also become charged. If steam is to be used for either purging or cleaning a tank or other equipment, the steam discharge nozzle and all conductive insulated objects subject to impingement or condensation should be bonded to the tank or be grounded. Steam purging of tanks should be avoided when suitable alternatives are available. Further reference to steam cleaning of tanks is found in NFPA 327.

4.3 Testing

4.3.1 The tank atmosphere and the excavation area should be regularly tested for flammable or combustible vapor concentrations until the tank is removed from both the excavation and the site. Such tests are to be made with a combustible gas indicator which is properly calibrated according to the manufacturer's instructions (typically on pentane or hexane in air), and which is thoroughly checked and maintained in accordance with the manufacturer's instructions. Persons responsible for testing must be completely familiar with the use of the instrument and the interpretation of the instrument's readings.

4.3.2 The tank vapor space is to be tested by placing the combustible gas indicator probe into the fill opening with the drop tube removed. Readings should be taken at the bottom, middle, and upper portions of the tank, and the instrument should be cleared after each reading. If the tank is equipped with a non-removable fill tube, readings should be taken through another opening. Liquid product must not enter the probe. Readings of 20 percent or less of the lower flammable limit must be obtained before the tank is considered safe for removal from the ground.

4.3.3 Combustible gas indicator readings may be misleading where the tank atmosphere contains less than 5 percent by volume oxygen, as in a tank vapor-freed with CO_2, N_2, or another inert gas. In general, readings in oxygen-deficient atmospheres will be on the high, or safe, side. It may be desirable to use an oxygen indicator to assess the oxygen concentration.

4.4 Removal

4.4.1 After the tank has been freed of vapors and before it is removed from the excavation, plug or cap all accessible holes. One plug should have a 1/8-inch vent hole to prevent the tank from being subjected to excessive differential pressure caused by temperature changes. The tank should always be positioned with this vent plug on top of the tank during subsequent transport and storage.

4.4.2 Excavate around the tank to uncover it for removal. Remove the tank from the excavation and place it on a level surface. Use wood blocks to prevent movement of the tank after removal and prior to loading on a truck for transportation. Use screwed (boiler) plugs to plug any corrosion holes in the tank shell.

4.4.3 When partially or totally removing an existing underground storage system, a small amount of contaminated backfill may be encountered. The contamination can be due to minor spills and drips during previous operation of the facility or from drips and minor spills that may occur during removal. Contaminated backfill may be a potential safety and environmental hazard. Spills or drips should be contained to minimize contamination during removal. If contamination is severe, consult local environmental officials, the fire marshal, or the USEPA for assistance and requirements. See API Bulletin 1628 for further information.

4.4.4 Tanks should be labeled after removal from the ground but prior to removal from the site. Regardless of the condition of the tank, the label should contain a

warning against certain types of reuse. The former contents and present vapor state of each tank, including vapor-freeing treatment and date should also be indicated. The label should be similar to the following in legible letters at least 2 inches high:

TANK HAS CONTAINED LEADED GASOLINE*

NOT VAPOR FREE

NOT SUITABLE FOR STORAGE OF FOOD OR LIQUIDS INTENDED FOR HUMAN OR ANIMAL CONSUMPTION

DATE OF REMOVAL: MONTH/DAY/YEAR

*Or other flammable/combustible liquid. Use the applicable designation, for example, DIESEL.

4.4.5 Tanks that have held leaded motor fuels (or whose service history is unknown) should also be clearly labeled with the following information (see API Publication 2015A for additional guidelines):

TANK HAS CONTAINED LEADED GASOLINE
LEAD VAPORS MAY BE RELEASED IF HEAT IS APPLIED TO THE TANK SHELL

4.4.6 Tanks should be removed from the site as promptly as possible after vapor-freeing procedures have been completed, preferably on the day of tank removal from the excavation. If a tank remains at the site overnight or longer, additional vapor may be released from any liquid absorbed in the tank walls or residues remaining in the tank.

4.4.6.1 Before the tank is removed from the site, the tank atmosphere should be checked with a combustible gas indicator as specified in 4.3 to ensure that it does not exceed 20 percent of the lower flammable limit.

4.4.6.2 The tank should be secured on a truck for transportation to the storage or disposal site with the 1/8-inch vent hole located at the uppermost point on the tank. Tanks should be transported in accordance with all applicable local, state, and federal regulations.

SECTION 5—STORAGE OF USED TANKS

5.1 Storage Considerations

Even though used tanks that have contained flammable or combustible liquids have been vapor-freed at one time, they cannot be guaranteed to remain vapor-free. Hydrocarbons may be retained in crevices and under scale and may be released when disturbed or over a period of time. It is important, therefore, that appropriate safety precautions be observed at all times.

5.2 Storage Procedures

5.2.1 Tanks should be vapor-freed before being placed in storage (see 4.2). Tanks should also be free of all liquids and residues. All tank openings should be tightly plugged or capped, with one plug having a 1/8-inch vent hole to prevent the tank from being subjected to excessive differential pressure caused by temperature changes. Tanks should be stored with the vented plug at the highest point on the tank. All tanks should be labeled as described in 4.4.4 and 4.4.5.

5.2.2 Used tanks should be stored in secure areas on the premises of persons familiar with any attendant hazards and where the general public will not have access. A fenced yard, apart from other facilities, is desirable.

SECTION 6—SALE FOR REUSE

6.1 Considerations for Reuse

Careful consideration should be given to the reuse of tanks that have been in petroleum storage service. If a tank is sold for reuse, the purchaser should be given a very clear understanding of the former use and present condition of the tank. The seller of a tank to be returned to service in an underground petroleum storage system must inform the purchaser of the tank of the owner's notification requirements under applicable federal regulations (40 CFR 280.11 and 40 CFR 280.22). There may also be similar state or local regulations. Buyers of such tanks should check with the original manufacturer of the tank to determine its suitability for reuse. It is advisable to test the tanks for flammable vapors (see 4.3) before they are transported.

CAUTION: Tanks that previously contained gasoline must not be used for the subsequent storage of food or liquids intended for animal or human consumption.

6.2 Conditions of Sale

A bill of sale should be used to transfer tank ownership. The bill of sale should include the purchaser's acknowledgement that he assumes all liability related to the tank. Bills of sale should indicate the former use of the tank and carry the following warning regardless of the former contents of the tank:

TANK HAS CONTAINED LEADED GASOLINE*

NOT VAPOR FREE

NOT SUITABLE FOR STORAGE OF FOOD OR LIQUIDS INTENDED FOR HUMAN OR ANIMAL CONSUMPTION

*Or other flammable/combustible liquid. Use the applicable designation, for example, DIESEL.

SECTION 7—DISPOSAL

7.1 Disposal Criteria

7.1.1 Tanks should be disposed of when they are no longer fit for the storage of flammable or combustible liquids or any other appropriate use. Whether sold to a scrap dealer or disposed of at an acceptable facility, sufficient holes should be made in the tanks to render them unfit for further use.

7.1.2 Tanks that have been lined internally or coated externally with epoxy-based or similar materials may not be accepted by scrap processors. Prior inquiries should be made as to the requirements of the processor accepting the tank for scrap.

7.2 Disposal Procedures

7.2.1 After a tank has been vapor-freed, it should be rendered unsuitable for future use as a storage tank by puncturing, cutting, or drilling numerous holes in all sections of the tank.

7.2.2 All tanks should be labeled as described in 4.4.4 and 4.4.5.

7.2.3 A bill of sale should be used to transfer tank ownership (see 6.2).

7.2.4 Prior to disposal of used tanks, current federal, state, and local regulations should be checked to determine if special procedures or preparations are required.

APPENDIX K

STATE AGENCIES FOR

REGULATORY NOTIFICATIONS

Appendix II—List of Agencies Designated To Receive Notifications

Alabama (EPA Form). Alabama Department of Environmental Management, Ground Water Section/Water Division, 1751 Congressman W.L. Dickinson Drive, Montgomery, Alabama 36130, 205/271-7823

Alaska (EPA Form). Department of Environmental Conservation, Box 0, Juneau, Alaska 99811-1800, 970/465-2653

American Samoa (EPA Form). Executive Secretary, Environmental Quality Commission, Office of the Governor, American Samoan Government, Pago Pago, American Samoa 96799; Attention: UST Notification

Arizona (EPA Form). Attention: UST Coordinator, Arizona Department of Environmental Quality, Environmental Health Services, 2005 N. Central, Phoenix, Arizona 85004

Arkansas (EPA Form). Arkansas Department of Pollution Control and Ecology, P.O. Box 9583, Little Rock, Arkansas 72219, 501/562-7444

California (State Form). Executive Director, State Water Resources Control Board, P.O. Box 100, Sacramento, California 95801, 916/445-1533

Colorado (EPA Form). Section Chief, Colorado Department of Health, Waste Management Division, Underground Tank Program, 4210 East 11th Avenue, Denver, Colorado 80220, 303/320-8333

Connecticut (State Form). Hazardous Materials Management Unit, Department of Environmental Protection, State Office Building, 165 Capitol Avenue, Hartford, Connecticut 06106

Delaware (State Form). Division of Air and Waste Management, Department of Natural Resources and Environmental Control, P.O. Box 1401, 89 Kings Highway, Dover, Delaware 19903, 302/736-5409.

District of Columbia (EPA Form). Attention: UST Notification Form, Department of Consumer and Regulatory Affairs, Pesticides and Hazardous Waste Management Branch, Room 114, 5010 Overlook Avenue SW., Washington, DC 20032

Florida (State Form). Florida Department of Environmental Regulation, Solid Waste Section, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399, 904/487-4398

Georgia (EPA Form). Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, 3420 Norman Berry Drive, 7th Floor, Hapeville, Georgia 30354, 404/656-7404

Guam (State Form). Administrator, Guam Environmental Protection Agency, P.O. Box 2999, Agana, Guam 96910, Overseas Operator (Commercial call 646-8863)

Hawaii (EPA Form). Administrator, Hazardous Waste Program, 645 Halekauwila Street, Honolulu, Hawaii 96813, 808/548-2270

Idaho (EPA Form). Underground Storage Tank Coordinator, Water Quality Bureau, Division of Environmental Quality, Idaho Department of Health and Welfare, 450 W. State Street, Boise, Idaho 83720, 208/334-4251

Illinois (EPA Form). Underground Storage Tank Coordinator, Division of Fire Prevention, Office of State Fire Marshal, 3150 Executive Park Drive, Springfield, Illinois 62703-4599

Indiana (EPA Form). Underground Storage Tank Program, Office of Environmental Response, Indiana Department of Environmental Management, 105 South Meridian Street, Indianapolis, Indiana 46225

Iowa (State Form). UST Coordinator, Iowa Department of Natural Resources, Henry A. Wallace Building, 900 East Grand, Des Moines, Iowa 50219, 512/281-8135

Kansas (EPA Form). Kansas Department of Health and Environment, Forbes Field, Building 740, Topeka, Kansas 66620, 913/296-1594

Kentucky (State Form). Department of Environmental Protection, Hazardous Waste Branch, Fort Boone Plaza, Building #2, 18 Reilly Road, Frankfort, Kentucky 40601, 501/564-6716

Louisiana (State Form). Secretary, Louisiana Department of Environmental Quality, P.O. Box 44066, Baton Rouge, Louisiana 70804, 501/342-1265

Maine (State Form). Attention: Underground Tanks Program, Bureau of Oil and Hazardous Material Control, Department of Environmental Protection, State House—Station 17, Augusta, Maine 04333

Maryland (EPA Form). Science and Health Advisory Group, Office of Environmental Programs, 201 West Preston Street, Baltimore, Maryland 21201

Massachusetts (EPA Form). UST Registry, Department of Public Safety, 1010 Commonwealth Avenue, Boston, Massachusetts 02215, 617/566-4500

Michigan (EPA Form). Michigan Department of State Police, Fire Marshal Division, General Office Building, 7150 Harris Drive, Lansing, Michigan 48913

Minnesota (State Form). Underground Storage Tank Program, Division of Solid and Hazardous Wastes, Minnesota Pollution Control Agency, 520 West Lafayette Road, St. Paul, Minnesota 55155

Mississippi (State Form). Department of Natural Resources, Bureau of Pollution Control, Underground Storage Tank Section, P.O. Box 10385, Jackson, Mississippi 39209, 601/961-5171

Missouri (EPA Form). UST Coordinator, Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, Missouri 65102, 314/751-7428

Montana (EPA Form). Solid and Hazardous Waste Bureau, Department of Health and Environmental Science, Cogswell Bldg., Room B-201, Helena, Montana 59620

Nebraska (EPA Form). Nebraska State Fire Marshal, P.O. Box 94677, Lincoln, Nebraska 68509-4677, 402/471-9465

Nevada (EPA Form). Attention: UST Coordinator, Division of Environmental Protection, Department of Conservation and Natural Resources, Capitol Complex 201 S. Fall Street, Carson City, Nevada 89710, 800/992-0900, Ext. 4670, 702/885-4670

New Hampshire (EPA Form). NH Dept. of Environmental Services, Water Supply and Pollution Control Division, Hazen Drive, P.O. Box 95, Concord, New Hampshire 03301, Attention: UST Registration

New Jersey (State Form). Underground Storage Tank Coordinator, Department of Environmental Protection, Division of Water Resources (CN-029), Trenton, New Jersey 08625, 609/292-0424

New Mexico (EPA Form). New Mexico Environmental Improvement Division, Groundwater/Hazardous Waste Bureau, P.O. Box 968, Santa Fe, New Mexico 3750 505/827-2933

New York (EPA Form). Bulk Storage Section Division of Water, Department of Environmental Conservation, 50 Wolf Road, Room 328, Albany, New York 1223 0001, 518/457-4351

North Carolina (EPA Form). Division of Environmental Management, Ground-Water Operations Branch, Department of Natural Resources and Community Development, P.O. Box 27687, Raleigh, North Carolina 27611, 919/733-3221

North Dakota (State Form). Division of Hazardous Management and Special Studies, North Dakota Department of Health, Box 5520, Bismarck, North Dakota 58502-5520

Northern Mariana Islands (EPA Form). Chie Division of Environmental Quality, P.O. Box 1304, Commonwealth of Northern Mariana Islands, Saipan, CM 96950, Cabl Address: Gov. NMI Saipan, Overseas Operator: 9664

Ohio (State Form). State Fire Marshal's Office, Department of Commerce, 8895 E. Main Street, Reynoldsburg, Ohio 43068, State Hotline: 800/282-1927

Oklahoma (EPA Form). Underground Storag Tank Program, Oklahoma Corporation Comm., Jim Thorpe Building, Oklahoma City, Oklahoma 73105

Oregon (State Form). Underground Storage Tank Program, Hazardous and Solid Was Division, Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon 98204, 503/229-5788

Pennsylvania (EPA Form). PA Department Environmental Resources, Bureau of Wat Quality Management, Ground Water Unit 9th Floor Fulton Building, P.O. Box 2063, Harrisburg, Pennsylvania 17120

Puerto Rico (EPA Form). Director, Water Quality Control Area, Environmental Quality Board, Commonwealth of Puerto Rico, Santurce, Puerto Rico, 809/725-0717

Rhode Island (EPA Form). UST Registration Department of Environmental Management, 83 Park Street, Providence, Rhode Island 02903, 401/277-2234

South Carolina (State Form). Ground-Wate Protection Division, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201, 803/758-5213

South Dakota (EPA Form). Office of Water Quality, Department of Water and Natur Resources, Joe Foss Building, Pierre, Sout Dakota 57501.

Tennessee (EPA Form). Tennessee Department of Health and Environment, Division of Superfund Underground Storage Tank Section, 150 Ninth Avenue, North, Nashville, Tennessee 37219-5404, 615/741-0980